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A CULTURAL RESOURCES SURVEY TESTING, AND GEOMORPHIC EXAMINATION OF DITCHES 10, 12 AND 29, MISSISSIPPI COUNTY, ARKANSAS

by
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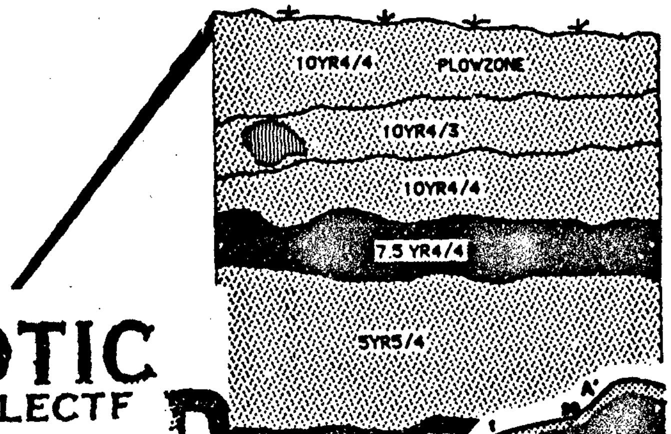

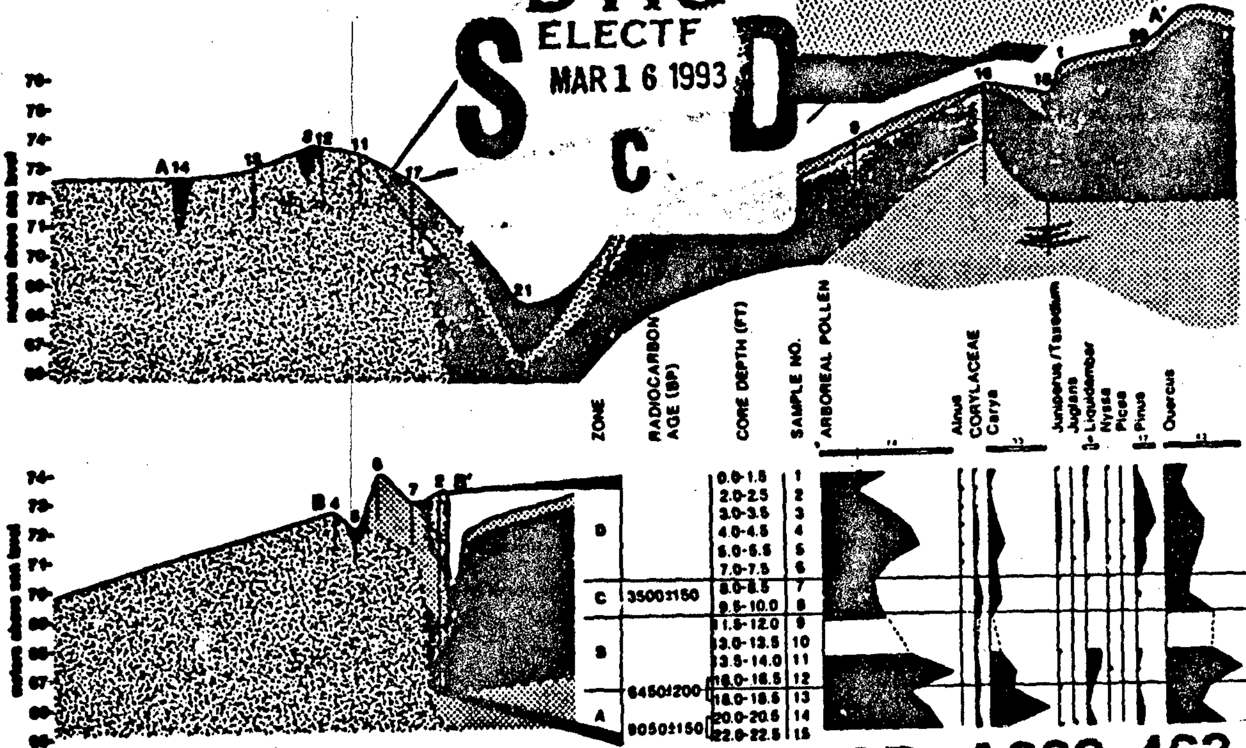

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RR2, Box 270, Lowell, AR. 72745

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April 1987

ABSTRACT

An archeological survey was conducted by Mid-Continental Research Associates along 35 miles of ditches 29, 10 and 11 in northern Mississippi County, Arkansas for the Memphis District, Corps of Engineers during February 1986. This survey resulted in the identification of 28 cultural resources. Eighteen of these were recently burned houses or dumps with records indicating initial occupation after 1945 and were not assigned state site numbers. Four large prehistoric sites were found to have stratified Woodland and Mississippian deposits and were determined to be significant in terms of the NRHP criteria. These were not tested in detail due to cancellation of the project in this part of the project area. Three sites were not tested because of the refusal of the landowner. These were in the canceled part of the project. The historic components were all determined to be too recent to be significant in terms of the NRHP criteria and will only be marginally impacted by the planned construction.

Geomorphic cores taken in the project area resulted in dating Big Lake and Pemiscot Bayou to about 10,000 BP. Pollen reconstruction of these two cores suggests that the Hypsithermal was not as severe as had been previously thought. The geomorphic model indicates that there is a high potential for buried sites in the natural levee along the west side of Big Lake, along the Buffalo Creek channel and in the meander belt on natural levees. The surface of the Relict Braided Terrace has no potential for buried sites and the backwater swamp between Big Lake and Blytheville has a low potentiality for buried sites. The predictive model suggests that large occupation sites will be situated on high dry places near water which is where they do occur.

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ACKNOWLEDGEMENTS

The sucessful completion of large mulitple discipline studies always involves the active cooperation of many different people. For the investigations to be successful it requires the investigators to have aggressive instincts in order to accomplish the project goals through a complex web of spatial, cultural, psychological and natural obstacles. The frontiers of knowledge and the unexpected obstacles encountered in an alien environment, often at the fringes of modern human habitation, make archeology exciting in ways not dissimilar to the cold chills up the spine aroused by such films as Raiders of the Lost Ark. Being on the edge is not always pleasant, even though some of us seem to thrive on adrenaline. Defeating the clowns of time by contributing to our knowledge of the past is a higher reward for such risks and makes it all worthwhile.

Mr. Doug Prescott, Contracting Officers Technical Representative, gave valuable assistance to the project by coordinating the overall effort with the needs of the Corps of Engineers and by providing technical background material and contacts with Drainage District 6 Officials. His thoughtful review has also contributed to the final product.

The archeological field work was under my personal direction, yet its success was a group effort by a crew composed of Michael Sierzchula, Kathryn A. King, Peter Cooper III, Michael Chapman, Susan Owens, and Barbara A. Lisle. Each individual showed initiative and perserverence in over coming the many obstacles faced by this project including a sandstorm, floods, heavy mud, the incredible mosquitos of Big Lake swamp and highly stressed landowners fighting to survive the collapse of the farms on Buffalo Island.

The people of Leechville and Buffalo Island made our stay pleasant. Mr. Bill Steed and the late Mrs. Twila Steed of the Twila Motel helped greatly in our becoming familiar with the people of the area and its recent history. Mr. Rouls of the Drainage District 6 Commission worked closely with us in obtaining landowner permission. Thanks to Mr. Donald J. Kosin of the U.S. Fish and Wildlife Service for granting permission to take the Big Lake core.

Dr. Margaret Guccione, assisted by Mr. Keith Smith, conducted the geomorphic work. She enlisted the aid Mr. David Foulkes (Soil Conservation Service [SCS], Jonesboro) and Mr. Larry Ward (SCS, Little Rock) in obtaining some of the core samples. Aerial photographs were provided by Mr. Grover P. Clinton (SCS, Osceola). The sediment lab work was largely conducted by Mr. John Fazio and Mr. Stephen Harris, geology students at the University of Arkansas, Fayetteville.

Dr. Beverely J. Watkins conducted the records search and wrote the historic research.

The continuous deep cores were taken by Professional Services Inc. of Memphis. Beta Analytical of Coreal Gables Florida did the radiocarbon analyses and Ms. Linda J. Scott and Ms. D. Kate Aasen conducted and wrote the pollen analysis.

The archeological laboratory analysis was conducted by Ms. Kathryn King, Mr. Don Warden, Mr. Paul Baumann, Mr. Peter Cooper, Ms. Barbara Lisle under the direction of Ms. Kathleen M. Hess.

The report was copy edited by Ms. Mary Printup, printed by Kinkos of Fayettevile and bound by Litho Printers and Bindery of Cassville, Missouri. Ms. Amy Hess drafted the figures for the report.

The close cooperation and feedback from these different analyses greatly enhanced the coherence of the final report.

Thanks are extended to all of these people for their effort, initiative, and ingenuity in producing a report which elucidates aspects of prehistory and makes clear the direction that many cultural resources management decisions should take in this environment. The Memphis District of the U. S. Army Corps of Engineers is to be congradulated on fulfilling its CRM legal obligation in such a contributory manner. As Principal Investigator, I take responsibility for the conclusions and recommendations made and any errors which were missed in the many reviews of this report.

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CHAPTER 1

INTRODUCTION AND BACKGROUND

by

Robert H. Lafferty III

A Cultural Resources Survey, Testing and Geomorphic Examination of Ditches 10, 12 and 29, in Mississippi County, Arkansas, (Ditch 29 Project) was conducted by Mid-Continental Research Associates (MCRA) for the Memphis District, Corps of Engineers (COE). This work was conducted in accordance with Contract No. DACW66-86-C-0034. Field work was conducted between February and June, 1986, and the laboratory work from April through August 1986.

The purpose of this work is to provide the COE with cultural resources inventory and evaluations in areas to be impacted by the deepening and widening of three drainage ditches in north Mississippi County, Arkansas. This work will place the COE in partial compliance with the National Historic Preservation Act (Public Law 89-665), the National Environment Policy Act of 1969 (Public Law 91-190), Executive Order 11593 (13 May 1971;36 CFR Part 800); Preservation of Historic and Archeological Data (P.L. 93-291) and the Advisory Council on Historic Preservation's "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800). The specific goals of this project were:

a. Research Design
b. Cultural Resources Review
c. Intensive Survey
d. Initial Site Testing
e. Geomorphic Study
f. Laboratory processing, analysis and preservation
g. Report Preparation
h. Curation (RFP:C-4.).

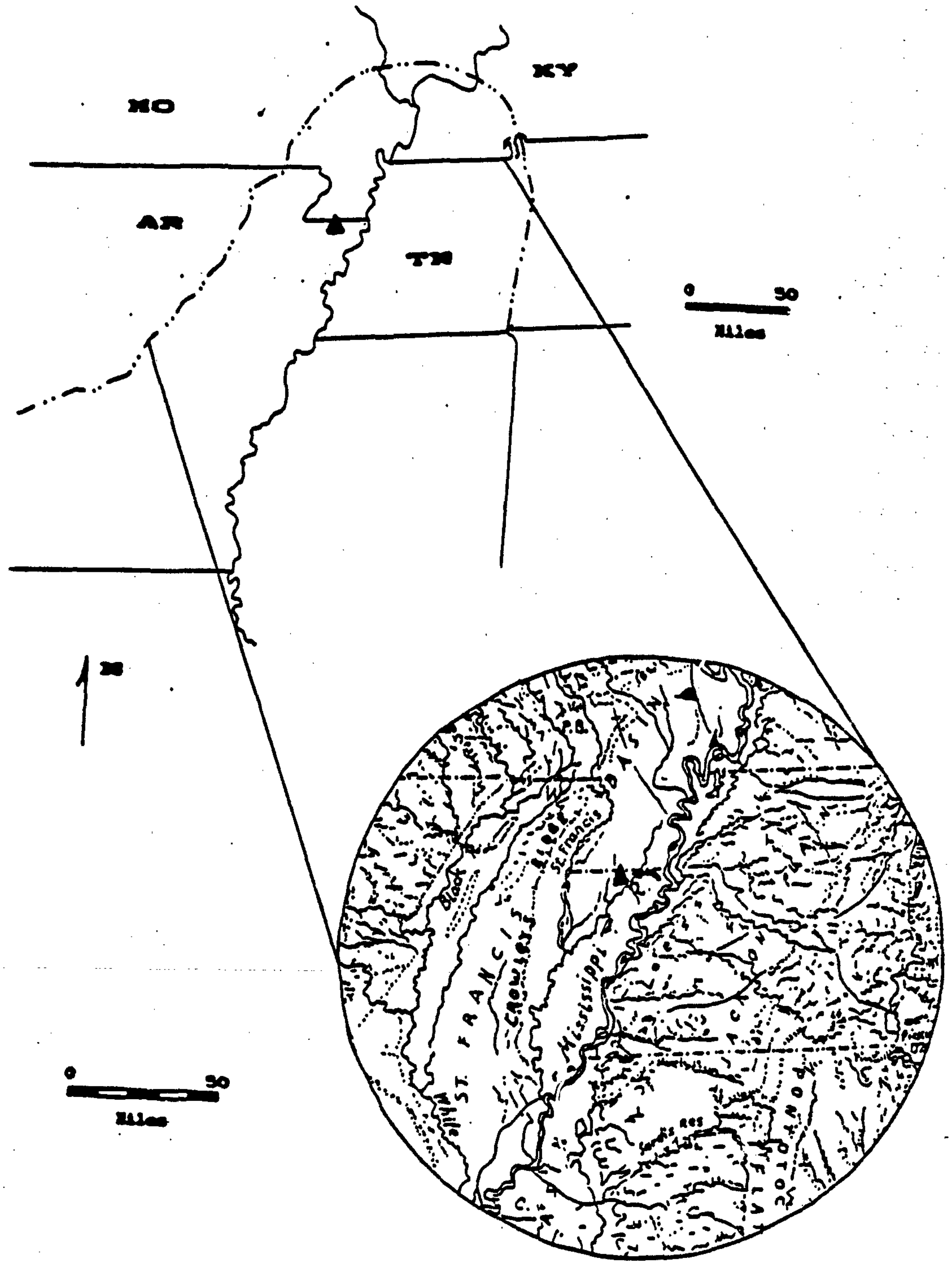


Figure 1. Project Area Location▲

PROJECT AREA LOCATION

The project area involved 52.8km (33 miles) of survey transects along three ditches in Mississippi County (Figure 1). The Ditch 29 transect starts at Pemiscot Bayou north of Blytheville, AR, and runs east along the Arkansas-Missouri Border to the State Line Outlet Ditch on the eastern edge of Big Lake National Wildlife Refuge. Ditches 10 and 12 parallel the western edge of Big Lake outside the levee from the Missouri-Arkansas border south for approximately 6 miles. They also involved 6 miles of ditches across the eastern part of Buffalo Island, between Big Lake and Buffalo Creek Ditch. These transects crossed five different physiographic environments: the Modern Meander Belt (Pemiscot Bayou), Big Lake Swamp (Ditch 29 on the Arkansas-Missouri border), the Relict Braided Surface (Buffalo Island); the escarpment on the eastern edge of Buffalo Island, and a filled-in channel incised into the Relict Braided Surface (near Buffalo Creek Ditch). These are discussed in Chapter 2.

OPERATIONAL RESEARCH DESIGN

The structure of planned research has long been understood to be an important factor in determining the results of the research (cf. Binford 1968; Taylor 1948). This is true of both the information gained and the efficiency of obtaining results by properly sequencing work steps using principals of critical path analysis. For example, in this project the recovery of a pollen column is an objective which can be obtained only by first locating a suitably preserved environment. Therefore, it is necessary to spend time locating these environments prior to taking core samples. In this section we outline the goals and structure of the proposed research.

The immediate project goal was the identification and evaluation of the cultural resources to be adversely affected by the project (RFP C-4.1 & 4.2). The longer term goal is to develop a set of predictive statements about where sites, particularly buried ones, are found in this environment. The latter objective involves detailed geomorphic reconstruction of the project including its past climate and will supply a detailed environmental context and understanding of the settlement systems which produced the observed settlement pattern (cf. Winters 1969: 110-112). The temporal structure of the different tasks were not mutually exclusive and did provide significant and necessary data and questions from one stage to the other. In the following section we briefly outline the operational design of the research and stated how the goals were accomplished and what is presented in this report.

CULTURAL RESOURCES REVIEW

A comprehensive cultural resources review of the records in the Office of the State Archeologist was performed in January prior to fieldwork. This included recording all known sites within 200m of the project area and photo copying of the General Land Office maps and the 1939 United States Geological Survey quadrangle maps. Seven known archeological sites within 200m of the project area were identified, including the Zebree site (3MS20). These sites were recorded on project maps so that they could be related to the sites discovered on the survey. After fieldwork had been completed we continued research into the history and prehistory of the project area in particular and the archeological region (cf. Willey and Phillips 1958) in general. All of this work is summarized in Chapter 4.

CULTURAL RESOURCES SURVEY

The cultural resources survey was conducted during the beginning of February 1986 with a crew of six persons. Over virtually all of the 52.8km (33 miles), survey area surface visibility was excellent, with fallow fields with near 100% visibility or very young winter wheat with 60-80% visibility. Only one area of 400m (1/4 mile) was in forest. This required closer spacing of the systematic shovel tests (normally placed every 200m and excavated to 50cm deep in all parts of the survey area) to 50m interval.

The survey resulted in the identification of only three previously known sites (3MS21, 3MS119, and 3MS199) in the project area. In addition 21 other locations were identified as potential archeological sites. These were duly reported to the Office of the State Archeologist (OSA). The OSA assigned eight site numbers to nine of the reported potential site locations. This results in a total of eleven archeological sites in the whole project area. Details on this fieldwork are presented in Chapter 3.

INITIAL SITE TESTING

The Scope of Work required a 25% Controlled Surface Collection (CSC) and a 1m x 1m test unit excavated to assess the depth and composition of the archeological matrix at each site. We had estimated that total collections would cover ~11,000 m2 and that 7 cubic meters would be excavated in the test units. Even though the sites were fewer than expected, four (3MS21, 3MS119, 3MS199 and 3MS471) were quite extensive. As a result 15,025 square meters of controlled surface collections were made in 5m x 5m controlled units on eight sites and one PS (29A1). With the exception of the four extensive sites, we have good control over the surface manifestation of all sites. The surface manifestations of the ninth site (3MS477) were so sparse that the artifacts were point plotted. The detailed results of this work is presented in Appendix B.

GEOMORPHIC STUDY

This fieldwork has included sampling exposed profiles and hand cores in the Buffalo Creek Channel, the Relict Braided Surface and the edge of Big Lake. Dr. Margaret J. Guccione, Assistant Professor of Geology at the University of Arkansas, provided on-site geomorphic description and interpretation of the pollen columns extracted from Big Lake (8m deep) and the Pemiscot Bayou Channel (6m deep). These pollen columns were analyzed by Ms. Linda J. Scott. Five radiocarbon dates run from the pollen cores, indicate that Big Lake and Pemiscot Bayou are nearly 10,000 years old.

Most of the east-west course of Ditches 10 and 12 are through the Relict Braided Surface laid down in terminal Pleistocene times. These are the oldest soils in the project area, are predominantly coarse sands, and have no chance of having buried archeological deposits contained in them.

On the west end of Ditches 10 and 12 is the old course of Buffalo Creek. This is an incised, braided channel that has filled in with more recent clays containing preserved wood. There is a high potential for buried deposits on the edges of these clays.

On the western edge of Big Lake, the seep ditch follows near the edge of the braided surface which has been buried by up to 2m, and perhaps more, of alluvially deposited fine sands and silts. These contain the deposits excavated in archeological sites 3MS21, 3MS119, 3MS199 and 3MS471. There is a high probability of buried sites from 3MS21 north, in the project area.

South of 3MS21 the soils are wet clays. The Osceola to Grand Prairie, Missouri, road swings 1/2 mile (.80km) toward the west along the well-drained soils on the edge of the braided channel. The channel cuts south along the course of Ditch 12 toward Manila. There is a low probability of deposits in this channel, but at the contact there is a higher probability.

Ditch 29 cuts through what was part of the lake bed of Big Lake west of State Route 151 below about 237 feet AMSL. East of this it cuts across high ground above 250 feet AMSL and then into Pemiscott Bayou. It cuts through the outside of the meander loop, which should have some of the most recent deposits in the project area. There is a high potential for recent prehistoric deposits along this edge of Pemiscott Bayou. The geomorphic work is detailed in Chapter 5 and the pollen work in Chapter 7.

PREDICTIVE MODEL

After the survey was completed, the areas surveyed, environmental data, and the known site locations were encoded and entered on the University of Arkansas computer. Because there were not enough site locations for statistical adequacy, the sample was augmented by the sites discovered in the Big Lake Transect, located 1/4 mile south of Ditch 12. This resulted in a model predicting site location reported in Chapter 6.

ARTIFACT PROCESSING, ANALYSIS, PRESERVATION, AND CURATION

We returned the artifacts to the laboratory and washed, numbered and analyzed the collection generated from this project. Collections are brought to the curation standards of the Arkansas Archeological Survey, which has agreed to curate the collections forever for the people of the United States. The artifacts were analyzed using the DELOS typology and are reported in Appendix B.

RECOMMENDATIONS

The age of the deposits along the western edge of Big Lake, demonstrated stratified archeological deposits, and age of artifacts directly attributable to 3MS119 all indicate that there are substantial buried deposits ranging from Dalton to Mississippian times. The four sites thus far tested have produced substantial stratified Woodland deposits that appear to span the whole Woodland period. It is quite probable that there are many more buried isolatable deposits in these sandy ridges and on the edges of the clay-filled swales incised into the Relict Braided Surface. There is a high probability of buried archeological deposits in these areas.

The sites tested on the edge of the Big Lake Swamp we believe are highly significant in terms of the NRHP criteria. The historic sites are all too recent and highly modified by agricultural practices to be considered significant. The results of the significance testing are detailed in Appendix B and summarized in Chapter 8. Recommendations for avoidance of impacts are detailed at the end of Chapter 8.

PROJECT CONSTRAINTS

The site testing was delayed during February and the first part of March by snow and freezing temperatures. This delay entailed further delays in the ability of the sub-contractors to complete their analyses, due to previous commitments. Further delays in the subcontractors' work were engendered by the radiocarbon laboratory sending the results of the radiocarbon dates to Arizona, rather than Arkansas.

The site testing was seriously constrained by the non-cooperation of one landowner, who owned several sites. A great deal of the project personnel and the Commissioners of Drainage District 6's time was spent in trying to convince this landowner to cooperate with the project.

CHAPTER 2

ENVIRONMENT

by

Robert H. Lafferty III

A discussion of the nature of the environment of the project area is presented in this chapter. This is an important and necessary part of this research because variation in the environment is used to predict the dispersion of prehistoric sites in the project area. Aside from the variation in the local environment, the nature of the surrounding physiographic regions is important, because these are source areas for many materials not present in the project area and because the structure of the surrounding landscape influences the structure of the major trade routes into the local region. This, along with local physiography, largely determines the structure of the central places. These relations have been discussed at length elsewhere (Lafferty 1977, Lafferty et al. 1981, 1984, Lafferty and House 1986) and are recapitulated in Chapter 6.

PHYSIOGRAPHIC ENVIRONMENT

The Ditch 29 project area is located in the Eastern Lowland Physiographic region, which is part of the Central Mississippi River Valley (Figure 2; Morse and Morse 1983). This portion of the Mississippi River Valley is a deeply incised canyon, known as the Mississippian Embayment, which has alluviated since the beginning of the Holocene. The valley is 80 miles wide at the project area and is divided roughly in half by Crowley's Ridge (Medford 1972:69).

The project area is three transects across five different landforms. Ditch 29 begins on the meander surface at Pemiscot Bayou and then cuts west across the lake bed of Big Lake which is superimposed on a sunken portion of the Relict Braided Surface. Ditches 10 and 12 parallel the western edge of Big Lake on an alluvial levee laid down by Little River on the eastern edge of the Relict Braided Surface. They also cut across the Relict Braided Surface and the divide between the Buffalo Creek and Big Lake known as the east side of Buffalo Island (Ferguson and Gray 1971:56; Sartain, n.d.). The western ends of Ditches 10 and 12 are over a filled-in channel incised into the Relict Braided surface.

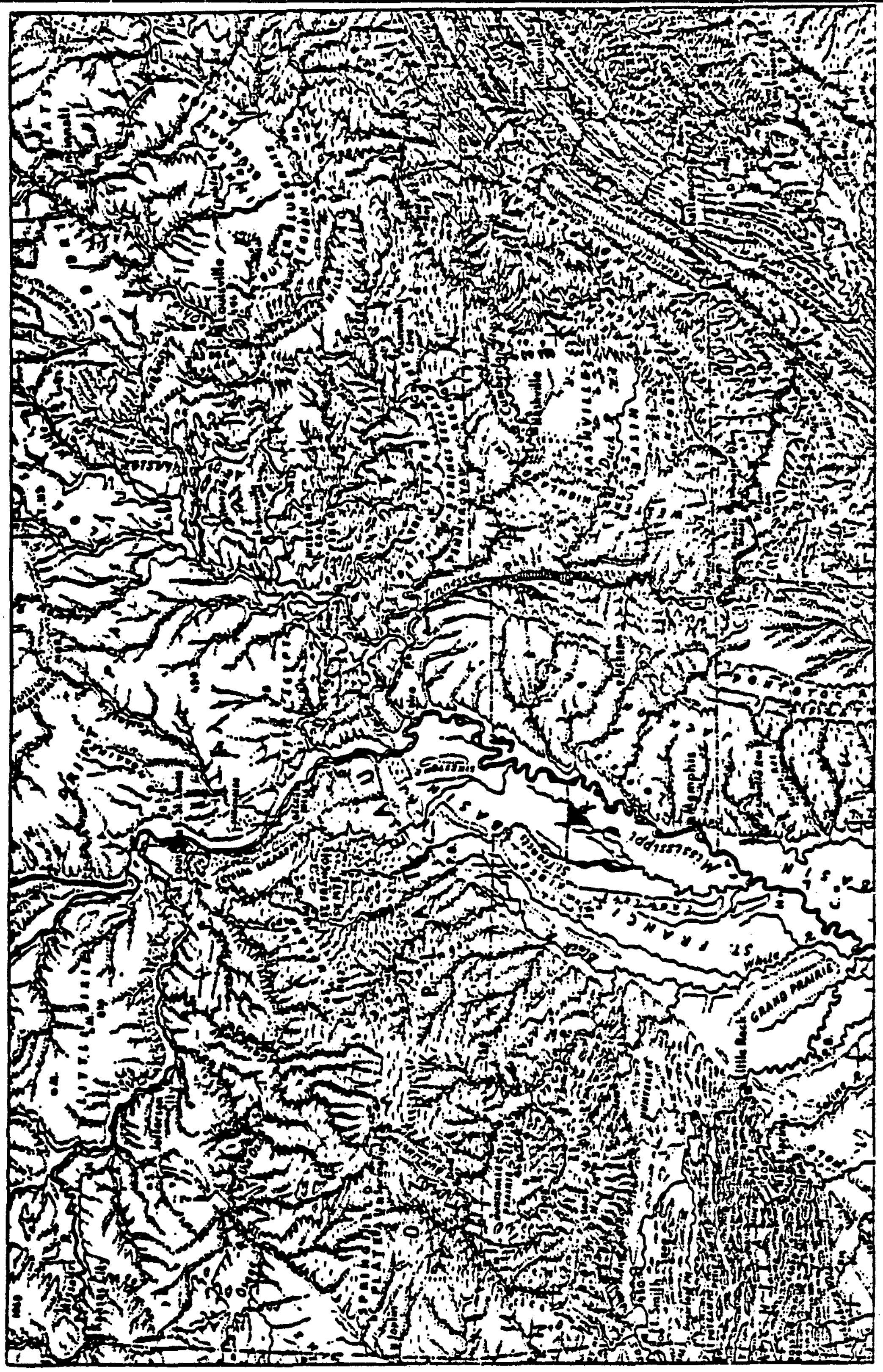


Figure 2. Central Mississippi River Valley Physiography (after Raisz 1978). Project area. ◣

The Mississippi River has formed the structure of the environment first by carving this great valley and, more recently, by depositing nearly a mile of silt within its confining rock walls. The alluvium deposited is largely stone-free with the largest common sediment size being sands deposited in the Relict Braided Surface and the alluvial levees. This has resulted in the formation of some of the best and most extensive agricultural land in the world, which has virtually no hard rocks or minerals. Prehistorically, and even today, rocks and minerals had to be imported from the surrounding regions.

The Mississippi River has also structured, and continues to structure, the transportational environment. The dominant direction of its movement from north to south has resulted in making resources upstream more accessible than those to the east or especially to the west. For example, to reach the Ozarks one must traverse three major rivers; the St. Francis, the Cache and the Black, all former channels of the Mississippi River in post-Pleistocene times. In pre-automobile times this was a tedious overland journey of 80 miles, which involved crossing many smaller bodies of water. This contrasts with 100 miles of floating downhill on the surface of the river. The river is still a major transportation artery for the central part of the continent and in earlier times was the only way to traverse easily this lowland region. In the 1840-1843 period, when the General Land Office (GLO) maps were made, all of the mapped settlements in the project area were positioned along the river (Chapter 4).

The Central Mississippi River valley is incised into the Ozark and Cumberland Plateaus. These coordinate proveniences were uplifted from the south by a tectonic plate movement from the southeast which pushed up the Ouachita Mountains and split the lower part of the Ozark-Cumberland plateau. At the time of this tectonic event, ca. 100 million years ago, these plateaus were inland seas with beachlines along the present course of the Boston Mountains in Central Arkansas and Sand Mountain/Walden Ridge in Alabama and Tennessee. These ancient sea beds are today limestones filled with many different kinds of cherts. Identification of these cherts as coming from specific formations is difficult because there is a great deal of variation within formations. This is made more confusing by the tendency for these formations to have different names in different states. For example, the Boone, Burlington and Ft. Payne "formations" are different names applied to the same formation in Arkansas, Missouri and Tennessee (respectively). Figure 3 shows the source area of some of the more important lithic resources. Some of these have well-known point source such as Dover, Mill Creek, Crescent and Illinois Hornstone. Other lithic resources occur over large areas and do not have known quarries, though they may exist (Butler and May 1984).

Figure 3. Major lithic sources in the Central Mississippi Valley area (after Raisz 1978).

Making the identification of these lithic resources more complex is the presence of Tertiary gravel beds around the edges of the Mississippian Embayment and on Crowley's Ridge. Crowley's Ridge is perhaps the most important of these because it occurs in the center of this otherwise stoneless plain. This deposit was laid down in Pliocene times when the river gradient was steeper than it is today. Crowley's Ridge has virtually every heavy hard kind of mineral which occurs in the Mississippi River Basin. Prehistoric sites on the edge of the western lowlands, even those situated directly on the Grandglaise Terrace, show a marked preference for the lithics found in the Ozarks over those of the terrace (e.g. 3IN17, Lafferty et al. 1981). Most of the gravel deposits adjacent to the Mississippi Valley to the east are covered with loess deposits up to 200 feet thick.

Investigations have shown that as one approaches Crowley's Ridge from both the east and the west there is a marked increase in the occurrence of utilized cobbles (e.g. cores) on prehistoric sites (Shaw 1981). This is true even though through time there are documented changes in the prehistoric preferences for utilization of different lithic resources. The reason that Crowley's Ridge gravel is used throughout the prehistoric record in the Central Mississippi Valley is that something is better than nothing, and, furthermore, because almost any kind of stone could be found there. Although the gravels were not the best quality stone possible, they were adequate for most purposes, were available, and were therefore utilized because nothing else was nearby. Even today, Crowley's Ridge is the main source of gravel for both the eastern and western lowlands. The rather intensive modern day use of gravel sometimes makes the distinction of aboriginal tools (such as scrapers and flake knives) between "gravel crusher-produced artifacts" and transported artifacts difficult.

One important class of lithic resources was volcanic materials, particularly the basalts, which were obtained in the St. Francis Mountains and used for axes, chisels and celts. Also of importance from this quarter were rhyolite and orthoquartzite, which likewise were used for various tools.

The Mississippi River has been the sole agent in structuring its valley. This structure has greatly influenced the development of the transportation routes. When De Soto and his men reached the Great River in 1541, they looked on a great transportation artery that stretched from the Gulf of Mexico (and beyond) into the heart of the continent. It was, however, navigated and controlled by fleets of dugout canoes that were both to harass and assist the Spanish over the next several years. As the conquistadors looked from the bluffs over the virgin forest-covered swamps, they never suspected that they were gazing upon both the graveyard and the salvation of their expedition. Most of the next two months the Spaniards spent slogging through one of the most difficult swamps encountered in the entire expedition, the St. Francis Sunk Lands (Morse 1981; Hudson 1984). The expedition was continually drawn back to the Great River and the high

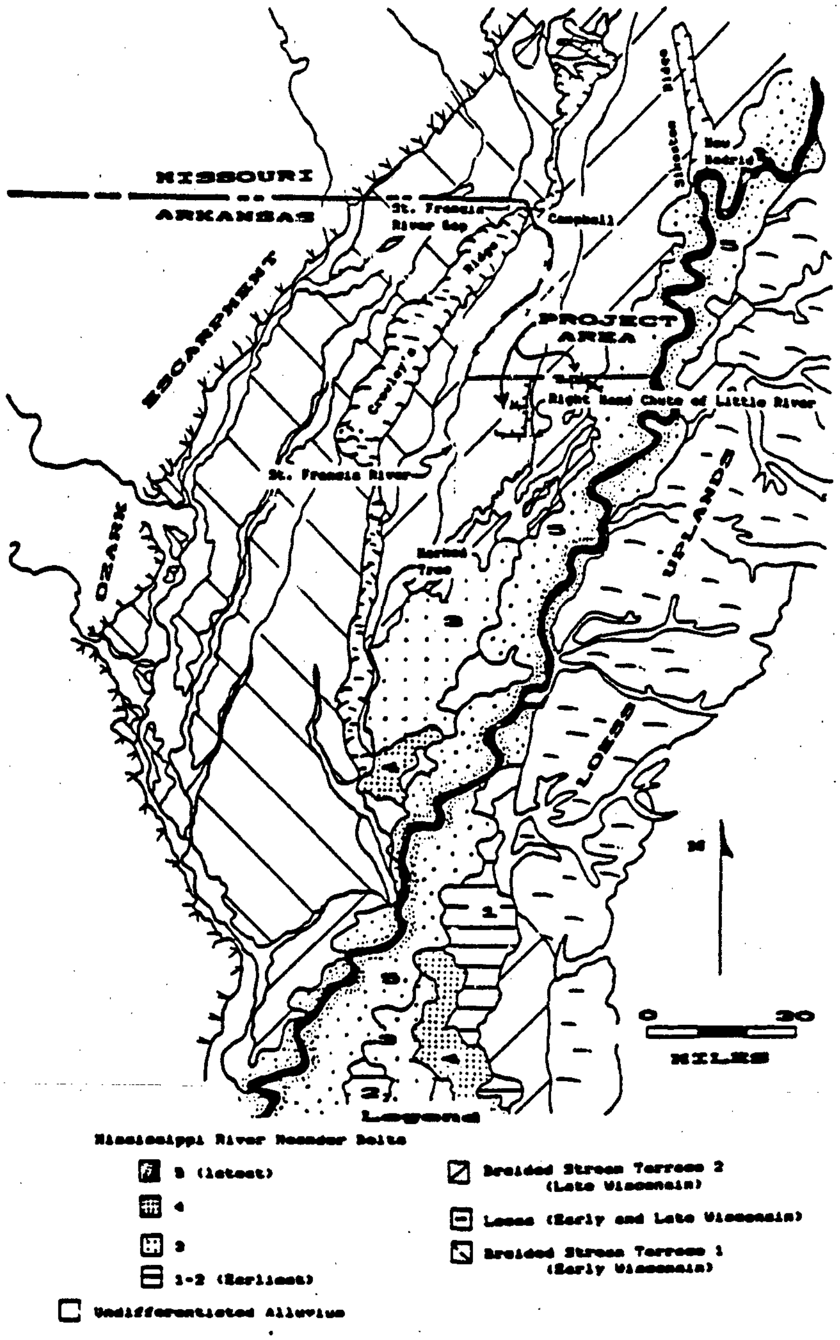


Figure 4. Geologic surfaces in the Central Mississippi Valley (after Saucier 1964).

chiefdom cultures, which they dominated using the techniques learned against the Aztecs and the Inca. The swampy lowlands impeded the expedition, especially when traversing from east to west. As they reached the Grand Granglaise terraces on the Ozark Escarpment, they encountered the great Toltec-Cahokia Road (which would later be known as the Natchitoches Trace, then the southwest Military Road, and currently US 67). This important road was on tractable ground with the swampy lowlands to the east and the more dissected plateau to the west. The expedition's speed doubled once they were on it (Hudson 1984, Akridge 1986). In the end, after many more side trips and high adventures, the hard-pressed expedition made its escape down the Great River in boats constructed with nails forged from their weapons. They were harassed by the Indians in large fleets of canoes all the way to the Gulf of Mexico.

In summary, the physiography of the Central Mississippi River has greatly circumscribed life in this environment. Transportation was much easier, though sometimes longer, on the rivers, particularly the Mississippi. Overland travel was easiest going around the lowlands or down Crowley's Ridge. People did not penetrate or live in this environment unless they were equipped with boats, lines and other tools with which to deal with an aquatic environment. This lowland forest was rich in plants and animals with some of the most productive soils on the continent. Also, there was a great profusion of mineral resources to be had in the nearby uplands. These minerals are known to have been widely traded from prehistoric times to the present.

PROJECT AREA PHYSIOGRAPHY

The local environment has always been important to human survival, because this is where areal bound resources necessary for survival were obtained in the pre-industrial world. The effect the local environment had on past cultures is often underestimated from our modern perspective--inside structures with controlled climates looking out on a largely artificial landscape.

The project area is today perhaps one of the most highly modified rural landscapes in North America. The major modifications to the landscape include: (1) timbering, which has totally changed the biota, (2) drainage of the swamps, which has made agriculture possible in the eastern part of the project area, and (3) landleveling, which is changing the topography, making agriculture more efficient and productive. These changes make it difficult to perceive, let alone measure certain facets of the environment and often obscure the locations of cultural resources. Therefore, the methods of measuring certain past environmental variation must be indirect because natural topography, flora, and fauna are no longer present in the landscape (Beadles 1976, Figures 5 and 6).

The project area is presently composed of four surfaces (Figure 4) laid down in the following sequence: the Relict Braided Surface (RBS), Big Lake Swamp, the boundary between Big Lake Swamp and Buffalo Creek Channel, and the Modern Meander Belt (MMB). All of these were deposited in Holocene times under different climatic and riverine regimes (Saucier 1974).

The Relict Braided Surface (RBS) was deposited in terminal Pleistocene times by the meltwater from the continental glaciers. This is the oldest surface in the project area and it comprises most of the survey area in the western part of the project area. This surface is composed of coarse alluvial sands and has well developed soils with a distinctive B horizon with iron and manganese concretions. These soils are variable but generally the best drained in the western part of Mississippi County, especially around Manila (Plate 4). This area has had very little accretion since the Holocene.

The Lake Bed of Big Lake Swamp is a major topographic feature of the eastern lowlands and was an effective barrier to transportation, as evidenced by the railroad and road routes around it. This and other incised channels, (Figure 5) most notably the Buffalo Creek Valley, are Holocene clays of much more recent times. The poorly drained clayey soils extend much farther east than the present area of Big Lake. This low lying area is coordinate to the St. Francis Sunk Lands which was apparently formed as a result of the New Madrid Earthquake of 1807-9. This and possible other earlier earthquakes also caused the many sand blows or patches of sand scattered over the clayey soils (especially the Sharkey clay) of the region. Sandblows are an earthquake phenomenon (Zoback et al. 1980; Muller, Waters, Santeford, Lafferty, and Everett-Dickenson 1975; Lafferty et al. 1984), and may be datable and therefore useful in establishing an earthquake chronology. These were observed along Ditch 29 and possibly in the low lying areas along the east end of Ditch 12.

The boundary between Big Lake and Buffalo Creek Valley Channel with the Relict Braided Surface is an important junction due both to its moderately high rate of alluviation and because it was a favored location for occupation. The Buffalo Creek Channel was incised into the Relic Braided Surface during terminal Pleistocene times. This has filled in during the Holocene with clays. The boundary between the Relict Braided Surface and Big Lake Swamp forms a 2m+ high escarpment, which is the most stark relief in this part of the world. This has been thickened by flooding from Little River.

The Modern Meander Belt (MMB) occupies the eastern part of the watershed and is almost totally confined to the extreme eastern end of Ditch 29. The archeological evidence collected in Tyronza Watershed (Lafferty et al. 1984, 1985a) suggests that the Mississippi River has been flowing in this part of the project area since Late Woodland times.

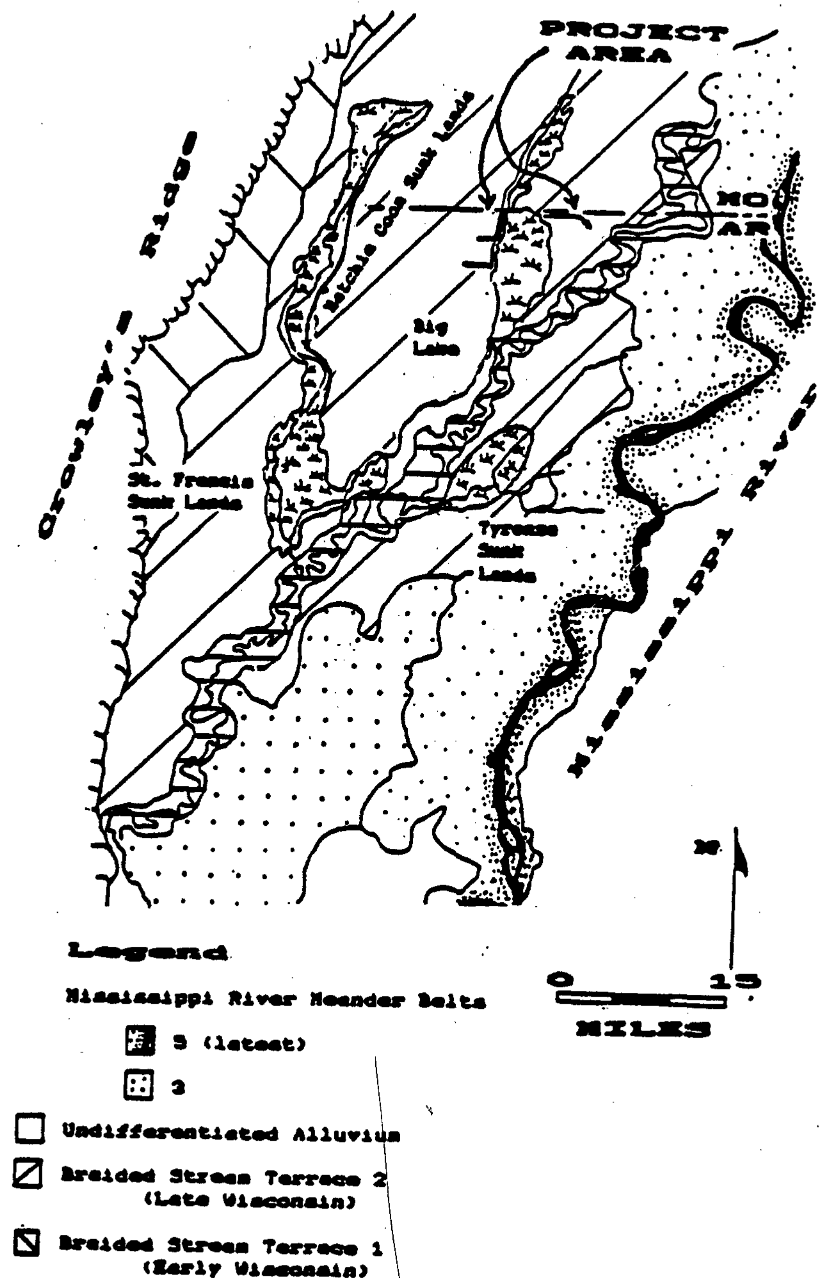


Figure 5. Geologic Surface and "Sunk Lands" in the Project Area Environ (after Saucier 1964).

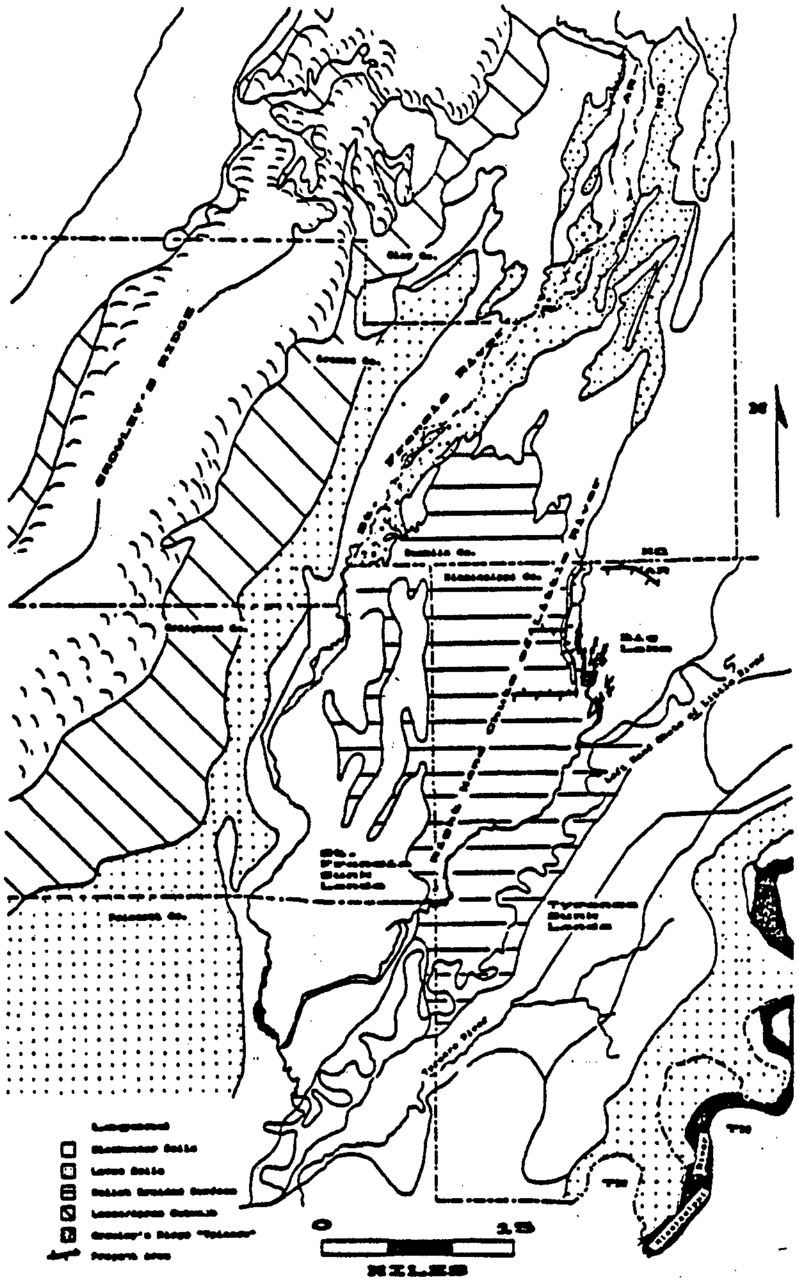


Figure 6. General Soils of the Project Area (after Ferguson and Gray 1971:General Soil Map)

SOILS

Soils are the best indicators of past environments (Figure 6). This is due to two characteristics of riverine bottom land: (1) the manner of deposition effectively sorts different sized particles by elevation, and (2) relative elevation and the water-table determines the kinds of biota which can inhabit a particular econiche. These relationships are well established by archeological, geological, and ecological research in the Lower Mississippi Valley (Lewis 1974; Beadles 1976; Harris 1980; Delcourt et al. 1980; King 1980). They are briefly discussed below and related to the basic variables utilized in this research, soils and plant communities.

Figure 7 presents a diagrammatic cross section of a riverine deposit. The river moves in the channel to the left. When it floods, the load capacity of the river is increased. When the river spills over its bank its velocity is immediately reduced. This lowers its load capacity and the largest particles it is carrying are deposited. The repeated flooding will gradually build up a natural levee composed of the largest particles available, sands and silts under the current gradient. This process can be fairly rapid. For example, there are documented instances of as much as 2m of sand being deposited in one flood (Trubowitz 1984). As the levee builds up, a backswamp forms away from the river and smaller particles, clays, are deposited under more slowly flowing slackwater conditions. Under a meandering regime, the river channel will eventually be cut off forming an oxbow lake. This will eventually fill with a clay plug. Many of these features are still directly observable on soil maps (Ferguson and Gray 1971) and in a few instances on topographic maps.

Table 1 presents the depositional environments of the soils found in Mississippi County which are based on the depositional environments described in the soil descriptions (Ferguson and Gray 1971:5-22).

Six soils are associated with levee tops. These are the best drained soils in the project area. The levee soils in the western part of the county (predominantly Tunica) are not as well drained as those in the east. About 19.5% of the soils in the county are classified as levee top soils, and are the best soils for agriculture in the predrainage landscape (Table 1).

Ten soils are found on the lower parts of the natural levees which formed an ecotone (Table 1). This environment was often seasonally flooded and as the levee built up, the particle sizes increased, resulting in silts overlying clays. These are more poorly drained than the levee soils but better drained than the swamp soils. These soils cover about 24.8% of the county.

Table 1. Mississippi County Soils and Origins

Code	Soil Type	Percent	Levee	Ecotone	Water
1	Alligator Clay	1.9			x
2	Alluvial Land	0.1			
3	Amagon Sandy Loam	2.1		x	
4	Borrow Pit	0.8			
5	Bowdre Silt Clay Loam	3.7	x		
6	Bruno-Crevasse	0.9	x		
7	Commerce Silt Loam	0.7		x	
8	Convent Fine Sandy Loam	2.4		x	
9	Crevasse Loamy sand	1.6	x		
10	Crowley Silt Loam	0.3		x	
11	Dundee Silt Loam	6.6		x	
12	Earle Clay	0.9			x
13	Forestdale Silt Loam	0.2		x	
14	Forestdale Silty Clay Loam	0.8		x	
15	Hayti Fine Sandy Loam	1.9		x	
16	Iberia Clay	0.2			x
17	Jeanerette Silt Loam	1.3	x		
18	Morganfield Fine Sandy loam	0.8	x		
19	Routon	8.5		x	
20	Sharkey Clays	40.4			x
21	Steele	8.6			x
22	Tiptonville Silt Loam	1.3		x	
23	Tunica Silty Clay	11.2	x		
	Mississippi Levee	0.4			
	Water Areas	2.4			
Totals	(percent of Miss. Co.)	100.0	19.5	24.8	52.0*
	Total acres represented	596,480	116,313	147,927	310169

*Total percent does not include 3.7% of modern disturbances (Borrow pits, and Levee), recent deposits (Alluvial lands), and areas of standing water (after Ferguson and Gray 1971).

Five soils were formed in slackwater conditions found in swamps and oxbow lakes. These are clays that cover about 52% of the county. These soils were inundated and not farmable in the predrainage landscape. This contrasts with 2.4% of the county which in 1971 were classified as water areas (Table 1).

About 3.7% of the county is classified as non-soil areas. Alluvial lands consist of areas along the Mississippi River that are still undergoing alluviation. None of these are found in the project area. About 0.4 percent of the county consists of the Mississippi River Levee, which is the eastern watershed boundary. Borrow pits and lakes comprise the other non-soil areas. Several of the former are present in the project area.

A comparison of the percentage composition of the soils in the county and those found in the project area, along the ditches indicates that there are certain biases in this sample which correspond to the desirability of placing the ditches low in the landscape (Table 2). The project environment data were derived from the soil manual (Ferguson and Gray 1971) and encoded by units of analysis. Since these boundaries did not always correspond exactly with the soils boundaries, there are some slight errors. The rule of thumb followed in encoding these if there was more than one soil type in the unit was (1) if the soil type covered more than 1/2 of the unit, the larger area was encoded; (2) if there was a small area of a soil type which was not represented in adjacent units, the small patch was encoded; (3) if the soil boundary paralleled the ditch, the soil type directly adjacent to the ditch was encoded. Most of the time such decisions were not necessary because the soils were in large blocks without boundaries in the units.

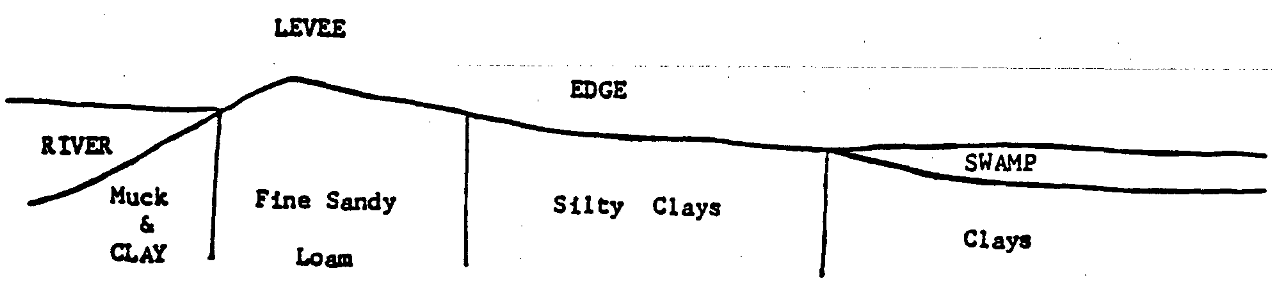


Figure 7. Cross section of riverine soils and plant communities (after Lewis 1974)

Table 2. Mississippi County and project area soils

Code	Soil Type	Percent: Miss. CO	Project Area
1	Alligator Clay	1.9	
2	Alluvial Land	0.1	
3	Amagon Sandy Loam	2.1	
4	Borrow Pit	0.8	
5	Bowdre Silt Clay Loam	3.7	
6	Bruno-Crevasse	0.9	
7	Commerce Silt Loam	0.7	
8	Convent Fine Sandy Loam	2.4	
9	Crevasse Loamy sand	1.6	1.5
10	Crowley Silt Loam	0.3	
11	Dundee Silt Loam	6.6	24.6
12	Earle Clay	0.9	
13	Forestdale Silt Loam	0.2	
14	Forestdale Silty Clay Loam	0.8	
15	Hayti Fine Sandy Loam	1.9	
16	Iberia Clay	0.2	
17	Jeanerette Silt Loam	1.3	
18	Morganfield Fine Sandy loam	0.8	
19	Routon	8.5	32.1
20	Sharkey Clays	40.4	32.8
21	Steele	8.6	6.0
22	Tiptonville Silt Loam	1.3	3.0
23	Tunica Silty Clay	11.2	
	Mississippi Levee	0.4	
	Water Areas	2.4	
Totals	(percent of Miss. Co.)	100.0	100.0
	Acres	596,480	1,340

(Ferguson and Gray 1971 and project-generated records).

```
                         Figure 8.  Surface Soil Textures in 153 Shovel Tests
                                        FREQUENCY BAR CHART
SOILTXT1            Soil Texture, Top Soil Layer                          FREQ  CUM.   PERCENT    CUM.
                                                                                FREQ             PERCENT
clay               |**************                                         14     14     9.15      9.15
silty clay         |**************                                         14     28     9.15     18.30
clayey silt        |**                                                      2     30     1.31     19.61
silt               |*                                                       1     31     0.65     20.26
saney silt         |****                                                    4     35     2.61     22.88
silty/fine sand    |*****                                                   5     40     3.27     26.14
sand               |**************************************************     50     90    32.68     58.82
clayey sand        |**                                                      2     92     1.31     60.13
clay/silt/sand     |*****                                                   5     97     3.27     63.40
sandy clay         |**************                                         14    111     9.15     72.55
sandy loam         |*********************************                      33    144    21.57     94.12
silty loam         |*********                                               9    153     5.88    100.00
                   ----+----+----+----+----+----+----+----+----+----+
                       5   10   15   20   25   30   35   40   45   50
                                       FREQUENCY
```

Figure 8. Surface Soil Textures in 153 Shovel Tests.

```
                         Figure 9.  Second Level Soil Textures In 149 Shovel Tests                                 13
                                                                                         11:49 MONDAY, NOVEMBER 24, 1986
                                          FREQUENCY BAR CHART

SOILTXT2         Soil Texture, 2nd Soil Layer                                  FREQ   CUM.   PERCENT     CUM.
                                                                                      FREQ             PERCENT
clay             |***********************************                            35     35     25.00     25.00
silty clay       |********                                                        8     43      5.71     30.71
clayey silt      |*************                                                  13     56      9.29     40.00
sand             |*******************************************************************  67    123     47.86     87.86
clayey sand      |***                                                             3    126      2.14     90.00
clay/silt/sand   |***                                                             3    129      2.14     92.14
sandy loam       |*******                                                         7    136      5.00     97.14
silty loam       |***                                                             3    139      2.14     99.29
clayey loam      |*                                                               1    140      0.71    100.00
                 ----+----+----+----+----+----+----+----+----+----+----+----+----+--
                     5   10   15   20   25   30   35   40   45   50   55   60   65
                                          FREQUENCY
```

Figure 9. Second Level Soil Textures in 140 Shovel Tests.

The soils in the project area are not representative of the soils generally found in Mississippi County; however, they do coincide with the major landforms identified in the project area.

Crevasse and Dundee are levee soils that were found on the edges of Big Lake. These are well drained and some of the best soils in the project area, and were laid down by the Little River probably when the Mississippi River occupied this course. These soils have aggraded the most in the project area, and we believe that they contain the highest probability of buried archeological sites.

The Routon, Steele and Tiptonville soils are the best drained in the project area and more or less comprise the Relict Braided Surface in the project area. These soils have well developed B Horizon and were quite distinct due to the much more mottled and concretion-filled profiles in the shovel tests. These soils made up 41% of the project area (Table 2).

The Sharkey clays are the most poorly drained soils in the project area but are more recent and often overlie the Relict Braided surface soils. These soils occurred in the project area in the eastern Big Lake area and in the Buffalo Creek Valley. These soils generally have a low site probability; however there is accumulating evidence that in many areas there is exceptional preservation and some sites are known from areas of these soils. The precise geomorphic context of these sites is not understood, but there is growing evidence that substantial deposits are in the gray gleyed clays and sometimes buried as much as a meter below the current surface (cf. Lafferty et al. 1985a; Sierzchula and Lafferty 1986).

The soil textures in the shovel tests generally agree with the soils map data. The surface soils (Figure 8) indicate only 20% of the shovel tests were in clayey soils, with most of the remaining of the soil textures being sands. The second level textures (Figure 9), however, were 39.5% clays which is about what is indicated in the soils maps. Most of the cases where there are sands overlying the clays are east of Big Lake in the lake bed area, where sand blows are common. In practice in the field we systematically shovel-tested high spots which were where sand blows occurred.

SOILS AND BIOTIC COMMUNITIES

The relationship of biota to riverine features in the Lower Mississippi Valley is well known (Lewis 1974; Lafferty 1977; Butler 1978; Morse 1981). Because of the radical changes in the environment in the past century, all of these are reconstructions based on named witness trees in the GLO survey notes. These studies have consistently identified plant communities associated with particular soil types which are diagrammatically presented in Figure 7.

There are two plant communities associated with the levees, the Sweetgum-Elm Cane Ridge Forest and the Cottonwood-Sycamore Natural Levee Forest. These plant communities were the driest environments in the natural landscape and had a high potential for human settlement. These two plant communities are in fact successional stages, with the Cottonwood-Sycamore forest being found along active river channel, while the Cane Ridge Forest is found on the levees of abandoned courses.

There are four aquatic biotic communities: river, lake, marsh and swamp. These low lying areas are unsuitable for human occupation. Several of these are involved in successional sequences; however, since about the Middle Woodland period all were present at any given time prior to drainage.

Between these two extremes are the river edge communities and the seasonal swamps. In drier times the latter contained areas suitable for occupation. The former is a line-like interface with a steep slope and little substantial flat area.

The correlation between soils and plant communities is not a 1:1 ratio. These deposits are building up, and what was at one time a swamp may in a few decades become a dry levee. This process brings about biotic successional changes. There is, however, a high correlation between soils and last successional stage plant communities. Because the surface is aggrading, the <u>widest possible extent</u> of habitable dry land as it was prior to levee construction and drainage is modeled. This combines the two successional stages of levee biotic communities that are indistinguishable with the synchronic perspective embodied in our data. The edge communities are lumped together, as are the aquatic environments. These cannot be distinguished in further detail with our present level of data, and it is probable that greater precision may be spurious. These communities are all modeled from the last stages of deposition.

Research using soils and plant communities to model prehistoric occupation in Northeast Arkansas (Dekin et al. 1978; Morse 1981; Lafferty et al. 1984), in the adjacent portions of the Missouri Bootheel (Lewis 1974; Price and Price 1981), and in the lower Ohio Valley (Muller 1978, Lafferty 1977, Butler 1978) have all suggested that sites are preferentially located on levee soils and are not found in aquatic deposits. Therefore these groupings of soils into biotic communities should yield a more powerful model that should be applicable to the whole project area. This is discussed in detail in Chapter 6.

MACROBIOTIC COMMUNITIES

These three "macrobiotic" communities - levee, ecotone, and swamp - are composed of different species of plants and animals. Table 3 presents an arboreal species composition reconstructed in Mississippi County, Missouri (Lewis 1974:19-28).

Levee

The Levee macrobiotic community includes two plant communities: (1) the Cottonwood-Sycamore community found along the active river channel and (2) the Sweetgum-Elm Cane Ridge forest on abandoned courses. The arboreal species found in the Sweetgum-Elm community include all of the species found along the natural levee; however, their mix is considerably different. These two communities are in the highest topographic position in the county and these areas also supported a dense understory of plants including cane (Arundinaria gigantea), spice bush (Lindera benzoin), pawpaw (Asimina triloba), trumpet creeper (Campsis radicans), red bud (Cercis canadensis), greenbrior (Smilax sp.), poison ivy (Rhus radicans) and a number of less frequent herbaceous plants. The most common of these was cane, which often formed nearly impenetrable canebrakes. These provided cover for many of the larger species of land animals and were an important source of weaving and construction material.

The major mammals included in this biotic community included white-tailed deer (Odocoileus virginianus), cougar (Felis concolor), black bear (Ursus americanus), elk (Cervis canadensis), skunk (Mephitis mephitis), opossum (Didelphus marsupialis), raccoon (Procyon lotor), eastern cottontail rabbit (Sylvilagus floridanus), gray fox (Urocyon cinereoargenteus), and gray squirrel (Sciurus carolinensis). Important avian species included the wild turkey (Meleagris gallopavo), the prairie chicken (Tympanuchus cupido), ruffed grouse (Bonasa umbellus), passenger pigeon (Ectopistis migratorius) and carolina paroquet (Conuropsis carolinensis).

Prior to artificial levee construction the natural levees were the best farmland in this environment. This is due to their location at the highest elevations from which the spring floods rapidly receded and drained. This environment provided for a large number of useful species of plants and animals, making it an attractive place for settlement at virtually all times (except during major floods) since they were laid down.

Table 3. Arboreal species composition of three biotic communities in Mississippi County, Missouri

Species	Levee	Edge	Swamp
American Elm (*Ulmus* sp.)	23	19	
Ash (*Fraxinus* sp.)	11	14	2
Bald Cypress (*Taxodium distichum*)		7	50
Black Gum (*Nyssa sylvatica*)	T	1	
Blackhaw (*Viburnum* sp.)	T		
Black Walnut (*Juglans nigra*)	2		
Box Elder (*Acer negundo*)	2		
Cherry (*Prunus* sp.)	T		
Cottonwood (*Populus* sp.)	1	3	
Dogwood (*Cornus* sp.)	1		
Hackberry (*Celtus occidentalis*)	12	9	
Hickory, (*Carya* sp.)	5	4	
Shellbark (*Carya laciniosa*)	T		
Hornbeam (*Ostrya virginiana*)	2		
Kentucky Coffee Tree (*Gymnocladus dioica*)	T		
Locust, ?	T		
Black (*Robinia pseudoacacia*)	T		
Honey (*Gleditsia triancanthos*)	T	1	14
Maple, (*Acer* sp.)	3	8	
Sugar (*Acer saccharum*)	1		
Oak, Black (*Quercus velutina*)	5	2	
Burr (*Quercus macrocarpa*)	1	3	2
Overcup (*Quercus lyrata*)	1		
Post (*Quercus stellata*)	T		
Red (*Quercus rubra*)	1	1	
Spanish (*Quercus falcata*)	1		
Swamp (*Quercus bicolor*)	T	1	
White (*Quercus alba*)	1	1	
Pecan (*Carya illinoensis*)	1	1	
Persimmon (*Diospyros virginiana*)	T	2	2
Plum (*Prunus* sp.)	T		
Red Haw (*Crataegus* sp.)	T	1	11
Red Mulberry (*Morus rubra*)	T		
Sassafras (*Sassafras albidum*)	T		
Sweetgum (*Liquidamber styraciflua*)	20	18	
Sycamore (*Platanus occidentalis*)	1		
Willow (*Silix* sp.)	1	2	18

Abbreviations: T=Trace (i.e. <1%); Data based on Lewis (1974:18-28).

Levee/Swamp Ecotone

This modeled macrobiotic community is what Lewis (1974:24-25) has called the Sweetgum-Elm-Cypress Seasonal Swamp. This ecotone (Figure 10) had fewer species present at any one time and a noticeably clear understory. The arboreal species composition (Table 3) includes more water-tolerant species (Cypress, Willow and Red Haw) and at times had aquatic animal species. These areas were flooded regularly every year for several weeks to several months, and the soils retained the moisture longer than on the levees. These locations were clearly much less desirable for occupation than were the levees but were easy to traverse in dry periods.

Different fauna also occupied the area at different seasons, drawn from the adjacent swamps and levees. In addition, this was a preferred habitat of the giant swamp rabbit (Sylvilagus aquaticus) and crayfish. In the changing of this environment from a wetland to a dry open swampscape it is probable that many aquatic species, such as fish, were stranded and were scavenged by the omnivores of the forest. These soils are characteristically poorly drained due to the presence of clays in the upper horizons. In this environment normally aquatic trees, especially cypress, would have been exploitable with land-based technology.

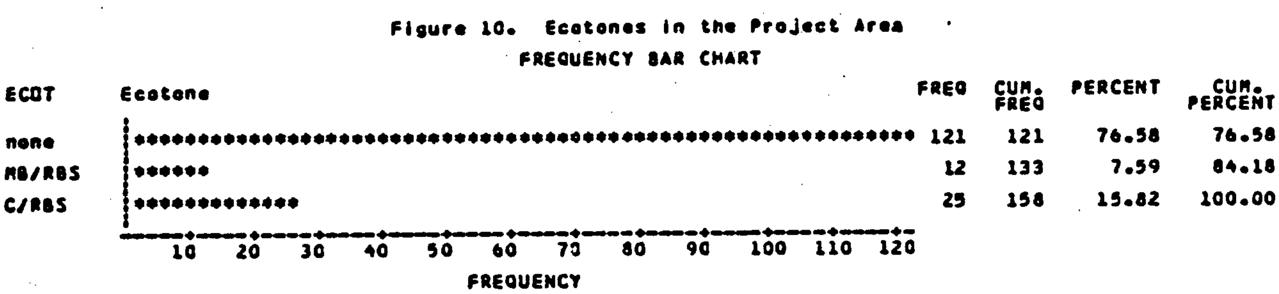


Figure 10. Ecotones in the Project Area

Swamp

Included in these modeled strata are all of the different environments which were underwater prior to drainage. This is defined by all of the soils deposited in slackwater conditions, which are also the lowest lying parts in the project area. Before the drainage the following different ecozones were included under this rubric: River Channels, Lakes, Marsh and Cypress Deep Swamp. These are different successional stages in this environment, but all are aquatic. The only one of the three which has arboreal species is the Cypress Deep Swamp (Table 3).

Several important herbaceous species were found in these aquatic environments. These included cattails (*Typha latifolia*), various grape vines (*Vitis* sp.), Button bush (*Cephalanthus occidentalis*), and Hibiscus (*Hibiscus* sp.). The latter were an important source of salt (Morse and Morse 1980).

The fauna of the aquatic environment were quite different from the terrestrial species, which mostly penetrated only the edge of the swamp. Beaver, mink and otter were important swamp mammals. Of special interest were fish and waterfowl which were in large quantities in this great riverine flyway. A means of water transportation is necessary to exploit these resources. Dugout canoes have been dated to at least 1000 B.C. and it is likely that they are a great deal earlier.

BIOTA

The plant communities have been reconstructed in detail for the western part of the project area, and, by inference, we can extend these reconstructions to the east based on the soils found to prevail in this part of the project area. Harris's reconstruction is shown in Figure 11. Four different floral communities were identifiable in the project area based on the GLO land maps. The Big Lake swamp contained a Cypress-hardwood plant association which is a particular kind of Southern Floodplain Forest (Kuchler 1964). In the Buffalo Valley there was a Cypress-Tupelo plant association which tends to be a more northern association, the beginning of the transition from a Southern Floodplain forest to a Temperate Floodplain forest found in Illinois (Voigt and Molenbrock 1964) and Missouri.

The so-called "highland" plant associations were defined as the Cottonwood-Willow-Sycamore plant association (Harris 1980:13-11) and the Sweetgum-Elm-Hackberry plant association. The former is a bit lower in the topography and sometimes has flooded. The latter is restricted to the highest elevations between the Buffalo and Big Lake valleys. These areas, and particularly the latter had high densities of nut trees and were probably also important to prehistoric diet.

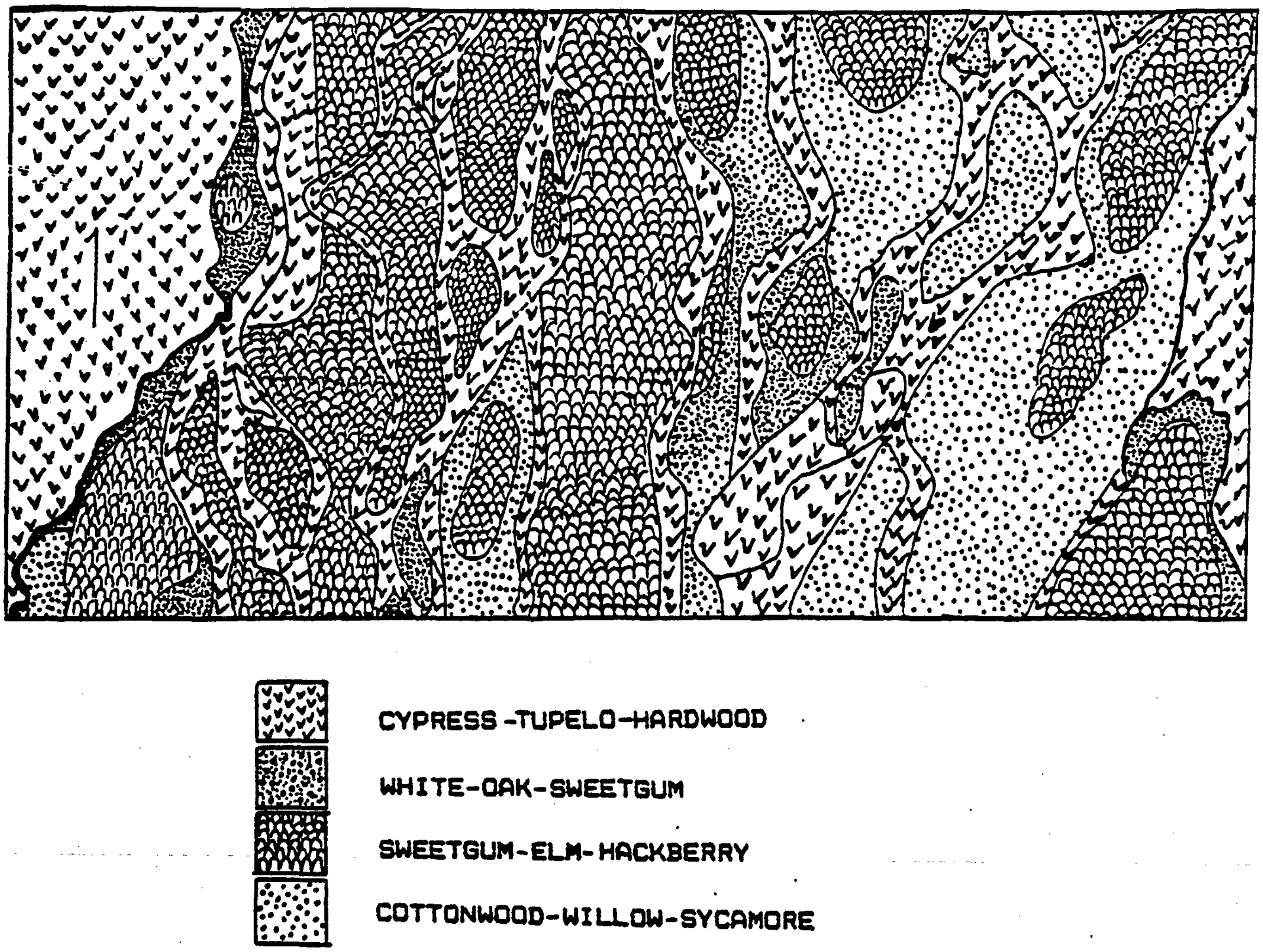


Figure 11. Reconstructed Biotic Communities in the Project Area (based on Harris 1980 and soils east of Big Lake).

SUMMARY

The project area along the west edge of Big Lake is one of the most favorable locations for human habitation in the Central Mississippi River Valley. This well drained scarp was seldom flooded and was accessible to the aquatic swamp resources of Big Lake and the more upland species of Buffalo Island.

CHAPTER 3

FIELD METHODS

by

Robert H. Lafferty III and Michael C. Sierzchula

The discussion below outlines the methods used during the archeological and geomorphic investigations along Ditches 10, 12, and 29. At the time of the survey each of the ditches exhibited similar survey conditions resulting in little variation in the methods used during the course of the project. Below we first outline the methods used in the cultural resources survey and summarize the results of this work. We next present a discussion of the significance testing carried out in the project. Finally we briefly outline the methods used in the geomorphic work, which ran concordantly with the testing phase of the project.

CULTURAL RESOURCES SURVEY METHODS

The cultural resources survey portion of the projects was carried out in early February, during a period of unseasonable warmth. The survey was organized around two crews of three persons consisting of a crew leader (the Principal Investigator or Project Archeologist) and two other persons. The crew leader carried a day map which was a xerox copy of his transect for the day, and he was responsible for locational control. Notes were made about the surface vegetation, placement of each shovel test and any discovered sites. The crew members carried a camera, a Munsell color book, shovels, machete and control column forms on which each shovel test was recorded. One crew member was responsible for pacing down the transect. Every 200 meters the crew would stop and excavate a shovel test. The soil was troweled through and the profile drawn.

A certain degree of variability was present in the width of the impact area along the ditches (Table 4). This variability, however, did not alter or require a change in the survey methods. A simple compression of the crew spacing, or, in the case of the west end of the project area along Ditch 29, the combination of the two survey crews was used to maintain a desirable crew spacing. The survey covered 33.19km of ditches. On Ditches 10 and 12 survey was conducted on both sides which resulted in a total of 54.24km surveyed.

The survey methods were designed to insure the retrieval of information addressing several areas of study. First is the need for information on the immediate subsurface variation (based on shovel tests) of soils within the project area, which could be related to deeper geomorphic profiles to facilitate the development of a predictive model. The second area deals with the methods necessary to locate and obtain a preliminary evaluation of all archeological sites recorded during the course of the project. The third area was the recovery of systematic data on survey conditions. Once the survey was completed we returned to the laboratory and coded this data for entry on the University of Arkansas computer. This resulted in the entry of data for each of 158 200m x 200m units of analysis (see Chapter 6). Turns and diagonal runs accounted for the 8-unit discrepancy between the number of units encoded and the total ditch transect length.

Table 4. Survey transect widths and crew spacing

Transect		Length (KM)	Side	Width (m)	Crew Space(m)
Ditch 29,	Segment 1	.87	S	30	5
	Segment 2	.16	S	130	20
	Segment 3	4.35	S	100	20
	Segment 4	4.89	S	83	27
	Segment 5	1.86	S	50	16
Ditch 12		10.86	Both	61	20
Ditch 10		10.19	Both	61	20

It was determined prior to initiating fieldwork that shovel tests would be excavated 200 meters apart to a depth of at least 50 centimeters below the surface. The information retrieved from the shovel tests included the Munsell color reading, soil type, and any additional information present, such as the presence of concretions. One hundred and fifty-three shovel tests were excavated in the project area. For the sake of continuity between the shovel tests one person on each survey crew was selected to record the information from the shovel tests. Data gathered from the shovel tests was intended to supplement and expand that retrieved from deeper geomorphic profiles.

To facilitate the discussion of the survey conducted and to retain a level of clarity as to what the crew spacing was at different points in the project area, each ditch is considered separately.

First, it should be stated that there were common points in the survey methods along each ditch. One person was selected to pace off the distance between the shovel tests placed 200 meters apart. The remaining crew members would inspect the ground surface, walking in an elongated zig-zag pattern. This procedure allowed maximum ground coverage within a reasonable time frame. If the ground surface on the spoil pile was exposed it was inspected by a single crew member for evidence of cultural remains.

Ditch 29

Five different project area widths were present along Ditch 29. The first segment was from the westernmost point of the ditch at the State Line Outlet Ditch east 870m (.54 miles). Both crews, six individuals, with a spacing of 5 meters, surveyed this portion of the project area. This segment was 61m wide and was located 100m south of the levee.

Segment 2 went from a point .54 miles west of the western boundary of the project area to a point .63 miles west of the west end of the project area (Plate 1). The crews were combined to insure adequate spacing on this and the following segment, which were 400 and 300 feet wide, respectively. Segments 4 and 5 were each surveyed with crews of three persons spaced as shown in Table 5.

Ditch 10

The project area encompassed both sides of Ditch 10. The project area on Ditch 10 was 200 feet wide and a crew spacing of 20 meters was used. On the east side of Ditch 10, parallel to the levee around Big Lake, the width of the project area was restricted by the levee to 25-50m wide (Plate 2). The crew members were spaced more closely in this part of the survey area. Shovel tests were excavated on only one side of this ditch because the soil maps indicated that the soils were the same on both sides of the ditch (Plate 3).

Ditch 12

Both sides of Ditch 12 were surveyed during this project. This ditch had a project area width of 200 feet requiring a crew spacing of 20 meters. The east side of Ditch 12 had the same project area width and crew spacing as did the east side of Ditch 10. Shovel tests were excavated on only one side of this ditch.

SURVEY CONDITIONS

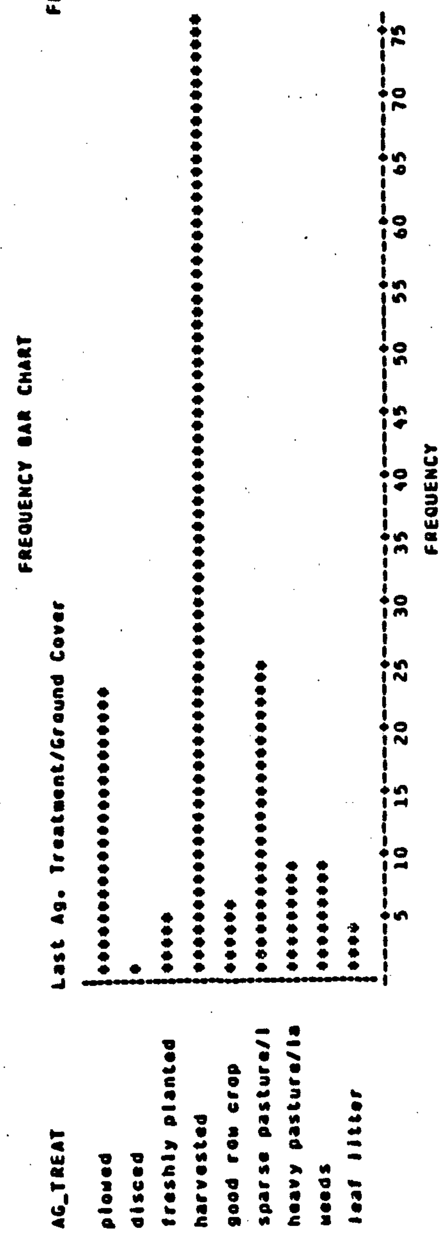
During the survey the surface was remarkably clear of vegetation. This is because at the time of the survey in February, the surface had been harvested (Figure 12) and allowed to lie fallow over most of the winter. The levee at west end of Ditch 29 was in pasture and there were about 800m of woods in which screened shovel tests were excavated. There were several areas with sparse grass over the surface (Plate 2) though there was relatively good visibility in most of these.

Over 75% of the area, surface visibility was 75% or better (Figure 13). In all areas except the forest there had been substantial rain prior to survey (Figure 14). These conditions were as nearly ideal as possible for the survey. Only in the forest were the surface conditions so obscure that closely spaced shovel tests were necessary.

Winter wheat was the only actively growing crop. In the 5.22% of the area which was covered in winter wheat visibility was well over 50% at the time of survey (Figure 15). The remainder of the crops shown in Figure 15 were remnants after the harvest. Grass was present in 4 km of the transects. Even in the areas where this was in heavy pasture, there were cow paths that were completely clear of vegetation. This occurred between the Big Lake Levee and Ditch 10. Intensive shovel testing was not undertaken in this area because (1) the soils were clays and (2) the opposite side of Ditch 10 was clear of vegetation and did not exhibit any sites.

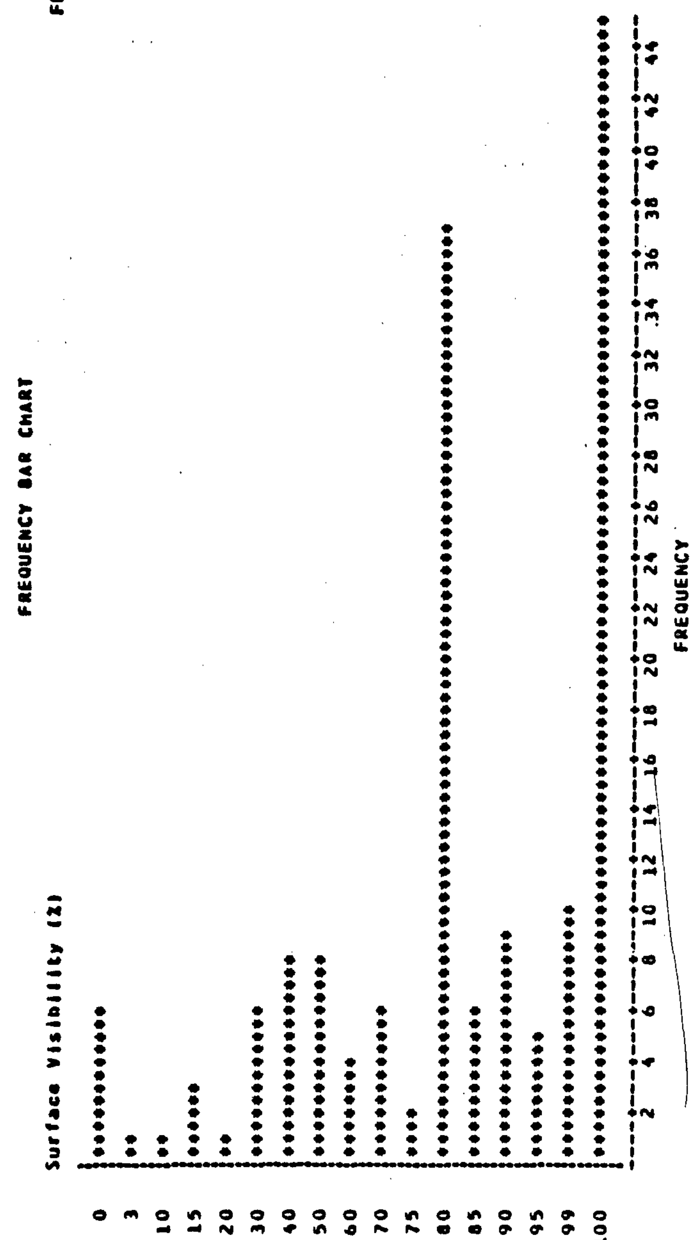
SURVEY RESULTS

The survey resulted in the discovery of 20 locations with cultural remains and the confirmation that three previously known cultural resources were within the project area. Eight of these new locations were assigned state site numbers. The remaining 12 locations were not assigned state site numbers because they were all too recent or were dump sites (Appendix B). Ten of the sites were tested for NRHP significance.



AG_TREAT	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
plowed	23	23	14.56	14.56
disced	1	24	0.63	15.19
freshly planted	5	29	3.16	18.35
harvested	76	105	48.10	66.46
good row crop	6	111	3.80	70.25
sparse pasture/l	25	136	15.82	86.08
heavy pasture/la	9	145	5.70	91.77
weeds	9	154	5.70	97.47
leaf litter	4	158	2.53	100.00

Figure 12. Most recent agricultural treatment in the project area.



Surface Visibility (%)	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	6	6	3.80	3.80
3	1	7	0.63	4.43
10	1	8	0.63	5.06
15	3	11	1.90	6.96
20	1	12	0.63	7.59
30	6	18	3.80	11.39
40	8	26	5.06	16.46
50	8	34	5.06	21.52
60	4	38	2.53	24.05
70	6	44	3.80	27.85
75	2	46	1.27	29.11
80	37	83	23.42	52.53
85	6	89	3.80	56.33
90	9	98	5.70	62.03
95	5	103	3.16	65.19
99	10	113	6.33	71.52
100	45	158	28.48	100.00

Figure 13. Surface visibility in the project area.

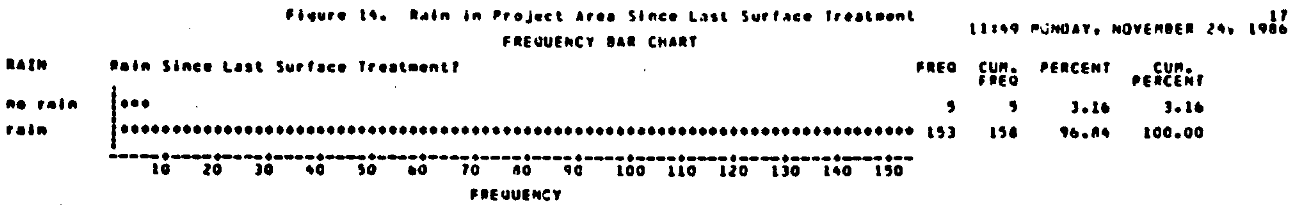


Figure 14. Rain since the last surface treatment.

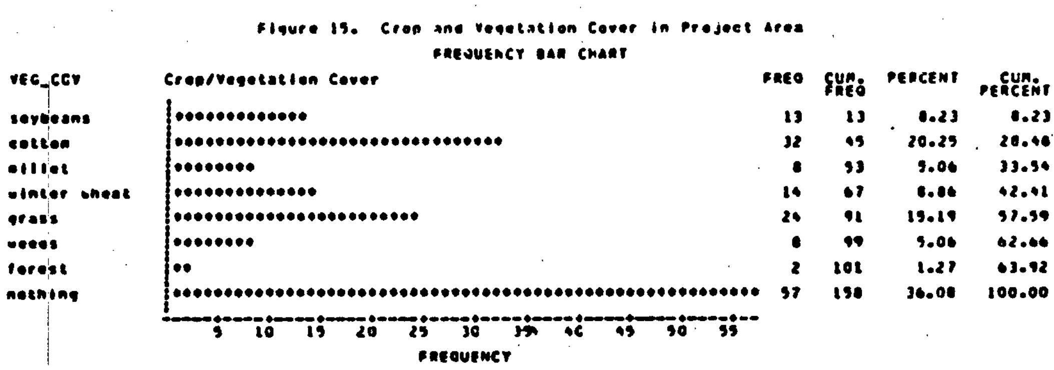


Figure 15. Crop and vegetation cover present in the project area during the cultural resources survey.

The thirty-six units with sites in them (Figure 16) do not equal a total of thirty-six archeological sites. Each unit with a site was entered in the matrix. Since some of the large sites covered more than one unit of analysis these sites had data entered in more than one unit. The historic sites also include the late historic sites too recent to be archeological sites.

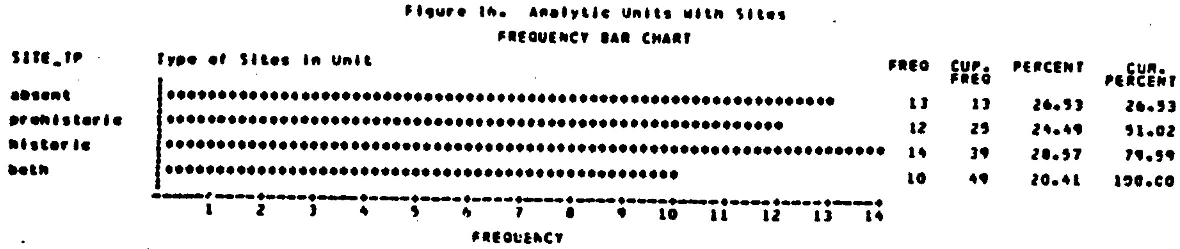


Figure 16. Analytical units with sites.

NRHP TESTING METHODS

We had originally planned to test all of the sites discovered or relocated; however, before this could be accomplished several factors intervened which made this impossible or otherwise unfeasible and dangerous.

Testing methods consisted of gridding the sites, making a controlled surface collection (CSC) over at least 25% of the site area and excavating one test unit to 20cm below the lowest cultural deposits. In addition, screened shovel tests were occasionally excavated and a select collection was made of any diagnostic artifacts not included in the CSC. Some variation from these ideal methods were the result of special conditions such as hitting the water table in several test units which are specified on a site-by-site basis in Appendix B.

Each site was staked with a transit and 50m tape. On large sites stakes were set every 5m on parallel transects 20-40m apart. The intervening points were pulled in with a tape. On small sites the transit was set up in the center, a cruciform was staked on the ground every 5m and the parallel legs were pulled in with two tapes. As part of this operation a permanent site datum was set on the edge of the field where it would not be disturbed by plowing. The datum was a 2-3 ft long piece of aluminum tubing driven flush with the ground. Part of the mapping noted the largest trees on the site and mapped them accurately with respect to the datum. The grid was oriented with the topography or magnetic north, depending on the orientation of the site. The origin of the Cartesian plain was set to the southwest well off the site so that the whole site was within one quadrant of the Cartesian grid.

The controlled surface collection was made in 5m x 5m units. Once the grid was established for the site, each crew member was assigned a row and given bags with the grid coordinates on them. Each crew member then walked systematically over the unit with eyes within 60cm of the ground and picked up and bagged every artifact observed. Notes were made on the bags of any significant vegetation cover or if there were no artifacts in the unit. The controlled surface collection was continued until no more material was encountered, or until the density became so low that we were very near the edge of the site.

After the CSC was made we excavated a test unit. This 1m x 1m test unit was positioned in a CSC unit which had a high density of artifacts and in some cases where the most spectacular "goodies" were found. Two test units were excavated on each side of the ditch cutting 3MS21. This was done to demonstrate that the ditch cut the site and that the artifacts on the east side of the ditch were not the result of dredging. The test units were excavated in 10cm arbitrary levels or less in the case where natural/cultural breaks were observed. All soil was screened through 1/4" mesh screen, and all artifacts retained were returned to the laboratory for cleaning, processing and analysis. When the units were backfilled we placed aluminum cans and 1986 pennies in the bottom to aid future excavators in the identification of the test unit.

GEOMORPHIC METHODS

The geomorphic fieldwork was structured to begin where previous researchers had left off (Saucier 1970, 1974). More specific details on methods and results are presented in Chapter 5. The relevant maps were obtained and these were augmented by aerial photographs obtained from the Arkansas Highway and Transportation Department and the USDA Soil Conservation Service in Mississippi County.

The geomorphic variation seen in the aerial photographs of the project area was systematically examined. Specifically the differences in the gray clay channel plugs and the older sandy relict braided surface were investigated by cutting profiles and taking hand tool soil cores. Most of this work was carried out during the NRHP testing program and defined much of the variability present in the project area.

By the middle of April we were able to define the variability present in the project area and had a good idea of where we were likely to find preserved pollen. The pollen cores were taken from these areas with a truck mounted 2" diameter coring rig rented from Professional Services Inc. of Memphis, Tennessee. One core was taken from the Boat Launch area of Big Lake National Wildlife Refuge under the terms of Special Use Permit No. BL-10-86. The second pollen core was taken from Pemiscot Bayou. The cores were described in the field by Dr. Guccione and the whole core was collected by depth and core orientation.

The cores were taken to the University of Arkansas geomorphology laboratory and split in half. One half was sent to the Archeobotanical Laboratory for analysis by Ms. Linda J. Scott. There, pollen was sampled every 35cm and radiocarbon samples were taken and sent to Beta Analytical of Coral Gables Florida, for dating. The other half was sampled for geomorphic sediment size analysis. These results are presented in Chapter 5.

CHAPTER 4

PREVIOUS RESEARCH AND CULTURAL HISTORY

by

Robert H. Lafferty III
and
Beverly J. Watkins

INTRODUCTION

Archeological research has been carried out in Northeast Arkansas and Southeast Missouri for nearly a century (Table 5). As with much of the Mississippi Valley, the earliest work was done by the Smithsonian Mound Exploration Project (Thomas 1894), which recorded the first site in the region. Most of these were the large mound groups. Since that time a great deal of work has been done in the Central Mississippi Valley area (cf. Willey and Phillips 1958 for definitions of technical terms) which has resulted in several extensive syntheses of the region's prehistory (Morse and Morse 1983; Chapman 1975, 1980). In this section we summarize the archeological research which has taken place, summarize what is known of the prehistory of the region and limits in these data as they apply to the project area.

PREVIOUS ARCHEOLOGICAL RESEARCH

The earliest professional archeological work in the region was the work carried out by the mound exploration project of the Smithsonian Institution (Table 5). Thomas (1894) and his associates excavated at three sites near the project area: Taylor's Shanty, Tyronza Station and the Jackson Mounds. These were all Mississippi period sites located outside the project area. This work was principally excavation in large mound sites, and identified the American Indians as the authors of the great earthworks of the eastern United States.

Table 5. Previous Archeological Investigations in Northeast Arkansas and Southeast Missouri.

Investigator	Location and Contribution
Potter 1880	Archeological investigations in Southeast Missouri
Evers 1880	Study of pottery of southeast Missouri
Thomas 1894	Mound exploration in many of the large mound sites in SE Missouri and northeast Arkansas
Fowke 1910	Mound excavation in the Morehouse Lowlands.
Moore 1910, 1911 1916	Excavation of large sites along the Mississippi, St. Francis, White and Black Rivers.
Adams and Walker 1942	Survey of New Madrid County
Walker and Adams 1946	Excavation of houses and palisade at the Mathews site
Phillips, Ford, and Griffin 1951; Phillips 1970	Mapped and sampled selected sites in SE Missouri, and NE Arkansas Lower Mississippi Valley Survey (LMVS), proposed ceramic chronology.
S. Williams 1954	Survey and excavation at several major sites in SE Missouri, original definition of several Woodland and Mississippi phases
Chapman and Anderson 1955	Excavation at the Campbell site, a large Late Mississippian Village in SE Missouri
Moselage 1962	Excavation at the Lawhorn site, a large Middle Mississippian Village in NE Arkansas
J. Williams 1964	Synthesis of fortified Indian villages in S. E. Missouri
Marshall 1965	Survey along I55 route, located and tested many sites north of the project area
Morse 1968	Initial testing of Zebree and Buckeye Landing Sites

Table 5 (Continued). Previous Archeological Investigations

Reference	Location and Contribution
J. Williams 1968	Salvage of sites in connection with land leveling, Little River Lowlands
Redfield 1971	Dalton survey in Arkansas and Missouri Morehouse Lowlands
Schiffer & House 1975	Cache River survey
Price et al. 1975	Little Black River survey
Morse and Morse 1976	Preliminary report on Zebree excavations
Chapman et al. 1977	Investigations at Lilbourn, Sikeston Ridge
Harris 1977	Survey along Ditch 19, Dunklin County, Missouri
Klinger and Mathis 1978	St. Francis II cultural resource survey in Craighead and Poinsett Counties, Arkansas
LeeDecker 1978	Cultural resources survey, Wappallo to Crowleys Ridge
Padgett 1978	Initial cultural resource survey of the Arkansas Power and Light Company transmission line from Keo to Dell, Arkansas
I. R. I. 1978	Cultural resources survey and testing, Castor River enlargement project.
Dekin et al. 1978	Cultural resources overview and predictive model, St. Francis Basin
LeeDecker 1979	Cultural resources survey, Ditch 29, Dunklin Coounty, Misssouri.
Morse 1979	Cultural resource survey inside Big Lake National Wildlife Refuge
J. Price 1979	Survey of Missouri and Arkansas Power Corporation power line in Dunklin County, Missouri
LeeDecker 1980a	Cultural resource survey, Ditch 81 control structure repairs

Table 5 (Continued). Previous Archeological Investigations

Reference	Location and Contribution
LeeDecker 1980b	Cultural resources survey, Upper Buffalo Creek Ditch, Dunklin County, Missouri, and Mississippi County, Arkansas
Morse and Morse 1980	Final report to COE on Zebree project
J.Price 1980	Archeological investigations at 23DU244, limited activity Barnes site, Dunklin County, Missouri
J. Price 1980	Cultural survey, near St. Francis River, Dunklin County, Missouri
Price and Price 1980	A predictive model of archeological site frequency, transmission line, Dunklin County, Missouri
C. Price 1982	Cultural resource survey, runway extension, Kennett Airport, Dunklin County, Missouri
Lafferty 1981	Cultural resource survey of route changes in AP&L Keo-Dell transmission line
Klinger 1982	Mitigation of Mangrum site
Santeford 1982	Testing of 3CG713
Bennett and Higginbotham 1983	Mitigation at 23DU227, Late Archaic through Mississippian site
Klinger et al. 1983	Mitigation at 3CT98, Crittenden County, Arkansas
Keller 1983	Cultural resources survey and literature review of Belle Fountain Ditch and tributaries
J. Price 1983	Phase II testing of Roo sites, Kennett Airport, Dunklin County, Missouri
J. & C. Price 1984	Testing Shell Lake Site, Lake Wappapello
Chapman 1975, 1980	Synthesis of Archeology of Missouri

Table 5 (Continued). Previous Archeological Investigations

Reference	Location and Contribution
Morse and Morse 1983	Synthesis of Central Miss. Valley prehistory
Lafferty et al. 1984, 1985a	Cultural resource survey, testing and predictive model, Tyronza Watershed, Mississippi County, Arkansas
Dicks and Weed 1986	Archeological investigations at 3CT50, Little Cypress Bayou site, Crittenden County, Arkansas

Most of the early work was concerned with the collection of specimens for museums (e.g.,Potter 1880; Moore 1910; Fowke 1910). Some of these data were used to define the great ceramic traditions in the eastern United States (Holmes 1903), including Mississippian. Many of these original conceptualizations are still the basis on which our current chronologies are structured (e.g. Ford and Willey 1941; Griffin 1952; Chapman 1952, 1980).

There was a hiatus in the archeological work in the region until the 1940s, when Adams and Walker began the first modern archeological work for the University of Missouri (Adams and Walker 1942; Walker and Adams 1946). Beginning in 1939 the Lower Mississippi Valley Survey (LMVS) conducted a number of test excavations at many of the large sites in the region (Phillips, Ford, and Griffin 1951; S. Williams 1954). This work has continued to the present in different parts of the valley (e.g., Phillips 1970; S. Williams 1984). The LMVS has produced definitions of many of the ceramic types in the Lower Mississippi Valley area and produced the first phase definitions for many of the archeological manifestations known in the latter part of the archeological record, particularly the Barnes, Baytown, and Mississippian traditions of the north (S. Williams 1954).
of the project area.

Beginning in the 1960s there has been an increase in the tempo and scope of archeological work carried out in the region. This has included a large number of survey and testing projects carried out with respect to proposed federally funded projects (Marshall 1965; Williams 1968; Hopgood 1969; Krakker 1977; Gilmore 1979; IRI 1978, Dekin et al. 1978, Lafferty 1981; Morse and Morse 1976, 1980; Morse 1979; Klinger and Mathis 1978; Klinger 1982; Padgett 1978; C. Price 1976, 1979,, 1980; J. Price 1976a, 1976b, 1978; Greer 1978; LeeDecker 1979; Price, Morrow and Price 1978; Price and Price 1980; Santeford 1982; Sjoberg 1976; McNeil 1980, 1982, 1984; Klinger et al. 1981). These projects are generally referred to as Cultural Resources Management studies and have greatly expanded the number of known sites from all periods of time. These projects have also produced a large body of data on the variation present on a range of different sites, and have greatly increased our knowledge of this area.

Along with these small-scale archeological projects there was a continuation of the large-scale excavation projects carried out in the region. Major excavations at the Campbell site (Chapman and Anderson 1955), Lawhorn (Moselage 1962), Snodgrass site (Price 1973; Price and Griffin 1979), Lilbourn (Chapman et al. 1977; Cottier 1977a, 1977b; Cottier and Southard 1977), Brogham Lake (Klinger et al. 1983) and Zebree (Morse and Morse 1976, 1980) have greatly expanded our understanding of the Mississippian cultures. This understanding has resulted in the definition of the temporal/ spatial borders between different Woodland and Mississippian manifestations and resulted in definitions of assemblages. Several major syntheses have resulted (Chapman 1975, 1980; Morse 1982a, 1982b; Morse and Morse 1983) which provide up-to-date summaries and interpretations of the work that has been carried out in the region.

PREVIOUS ARCHEOLOGICAL WORK IN THE BUFFALO ISLAND ENVIRONS

The Zebree archeological project was one of the largest excavation projects conducted in Arkansas. Over a period of 8 years large parts of this site were excavated. The excavations resulted in (among other things) the definition of the Big Lake Phase and produced much data on the Barnes culture (see below for more discussion of these archeological manifestations).

In 1983 New World Research, Inc., conducted a cultural resources survey and literature review of the Belle Fountain Ditch in Southeast Missouri and Northeast Arkansas. Part of this project involved survey of transects parallel to and between the MCRA project area and the ditch (Keller 1983). Keller found no archeological sites in this segment of Ditch 29, which he attributed to the older surface being buried by more recent backwater swamp clays.

STATUS OF REGIONAL KNOWLEDGE

The above and other work in adjacent regions have resulted in the definition of the broad pattern of cultural history and prehistory in the region (Figure 17); however, knowledge of the region is still sketchy, with few Archaic and Woodland sites having been excavated. This status has seriously constrained our understanding of settlement systems. Therefore, while this region may be fairly well known with respect to the Mississippi period, much more work needs to be done before the basic contents and definitions of many archeological units in space and time are adequate (cf. Morse 1982a). Presently we have a few key diagnos

TIME SCALE	CULTURAL STAGES	CULTURES & PHASES	ASSOCIATED ARTIFACTS & TRAITS
1541	Historic	American European Historic Indian	Wide spread trade, machine produced artifacts, glass, glazed pottery, widespread use of metals.
1000	Mississippian	Nodena Parkin Cherry Valley Lawhorn Big Lake	Palisaded villages with temple mounds, and satilite hamlets & farmsteads. arrow points, intensive farming, shell tempered pottery, wide spread riverine trade, food storage, stone hoes. rectanguloid celts.
AD 0 BC 500	Woodland	Barnes Baytown Marksville Tchula	Beginning of agriculture, pottery making (sand and grog tempered), dart points, celts.
5000	Archaic	Poverty Point Late Archaic Early Archaic Dalton	Seasonal use of different sites. hunting, fishing and foraging economy, dart points, grooved axes and a variety of stone tools (which persist in time), poverty point objects, adzes.
10,000 +?	Paleo-Indian		Fluted points, Big game hunting.

Figure 17. Cultural chronology of the Central Mississippi River Valley (after Morse and Morse 1983).

tic types associated with some cultural units; however, the range of artifact assemblage variation across chronological and spatial boundaries is not yet defined, nor are the ranges of site types known for any of the defined units. The adequate definition and resolution of these fundamental questions and problems are necessary before we can begin to reconstruct and use the data for understanding more abstract cultural processes, as is possible in better known archeological areas such as the American Southwest.

The Paleo-Indian period (10,000-8,500 B.C.) is known in the region from scattered projectile point finds over most of the area. These include nine Clovis and Clovis-like points from the Bootheel (Chapman 1975:93). No intact sites have yet been identified from this period, and the basal deposits of the major bluff shelters thus far excavated in the nearby Ozark Mountains have contained Dalton period assemblages. Lanceolate points are known from bluff shelters and high terraces (Sabo et al. 1982:54), which may represent different kinds of activities or extractive sites, as they have been shown to have been in other parts of the country. For the present any Paleo-Indian site in the region is probably significant.

The Dalton period (8,500-7,500 B.C.) is fairly well known in the Lower Mississippi Valley which has produced some of the better known Dalton components and sites in the central continent. These include the Sloan site (Morse 1973) and the Brand site (Goodyear 1974). These and other more limited or specialized excavations and analyses have resulted in the identification of a number of important Dalton tools (i.e., Dalton points with a number of resharpening stages, a distinctive adze, spokeshaves and several varieties of unifacial scrapers, stone abraders, bone awls and needles, mortars, grinding stones and pestles. At least three different site types have been excavated: the bluff shelters, which were seasonal habitation sites, a butchering station (the Brand site) and a cemetery (Sloan site). Presently we do not have the other part(s) of the seasonal pattern which should be present in the region, nor have any other specialized activity sites been excavated. Dalton sites are known in a number of locations, especially on the edge of the Relict Braided Surface, on Crowley's Ridge, and the edge of the Ozark Escarpment. Given the present resource base, a number of important questions have been posed concerning the early widespread adaptation to this environment (Price and Krakker 1975; Morse 1982a, 1976). Adjacent areas of the Ozarks have had modern controlled excavations from Rodgers, Albertson, Tom's Brook, and Breckenridge shelters (McMillan 1971; Kay 1980; Dickson 1982; Logan 1952; Bartlett 1963, 1964; Wood 1963; Thomas 1969).

The Early to Middle Archaic periods (7,500 - 3,000 B.C.) are best known from bluff shelter excavations in the Ozarks (Rodgers, Jakie's, Calf Creek, Albertson, Breckenridge and Tom's Brook shelters). During this long period a large number of different projectile point types were produced (i.e., Rice Lobed, Big Sandy, White River Archaic, Hidden Valley Stemmed, Hardin Barbed, Searcy, Rice Lanceolate, Jakie Stemmed, and Johnson). No controlled excavations have been done at any Early or Middle Archaic site in southeast Missouri or northeast Arkansas (Chapman 1975:152). There are no radiocarbon dates for any of the Archaic period from southeast Missouri (Dekin et al. 1978:78-79; Chapman 1980:234-238). The Middle Archaic archeological components are rare to absent in the Central Mississippi Valley leading the Morses to propose that the region was abandoned during this dry period (Morse and Morse 1983). Therefore, much of what we know of the archeological manifestations of this period is based on work in other regions, which has been extrapolated to the Mississippi Valley based on surface finds of similar artifacts. At present, phases have not been defined.

The Late Archaic (3,000 B.C. - ~500 B.C.) appears to be a continuing adaptation to the wetter conditions following the dry Hypsithermal. This corresponds to the Sub-Boreal Climatic episode (Sabo et al. 1982). The lithic technologies appear to run without interruption through these periods, with ceramics added about the beginning of the present era. Major excavations of these components have taken place at Poverty Point and Jaketown in Louisiana and Mississippi (Ford, Phillips and Haag 1955, Webb 1968). A fairly large number of Late Archaic sites are known in eastern Arkansas and Missouri (Chapman 1975:177-179,224; Morse and Morse 1983:114-135). Major point types include Big Creek, Delhi, Pandale, Gary and Uvalde points. Other tools include triangular bifaces, manos, grinding basins, grooved axes, atlatl parts and a variety of tools carried over from the earlier periods such as scrapers, perforators, drills, knives and spokeshaves. Excavations at the Phillips Spring site has documented the presence of tropical cultigens (squash and gourd) by ~2,200 B.C. (Kay et al. 1980). The assemblages recovered in the bluff shelters from this time period indicate that there was a change in the use from general occupation to specialized hunting/butchering stations (Sabo et al. 1982:63). There are some indications of increasing sedentariness in this period; however, the range of site types have not been defined. Late Archaic artifacts are well known from the region, with artifacts usually present on any large multicomponent site. Our understanding of this period is limited to excavations from a few sites (Morse and Morse 1983; Lafferty 1981). At present we do not know the spatial limits of any phases (which have not been defined), nor do we have any control over variation in site types and assemblages.

Early Woodland (500 B.C.(?) - 150 B.C.). During this period there appears to have been a continuation of the lithic traditions from the previous period with an addition of pottery. As with the previous period this is a very poorly known archeological period with no radiocarbon dates for the early or beginning portions of the sequence. The beginning of the period is not firmly established and the termination is based on the appearance of Middle Woodland ceramics dated at the Burkett site (Williams 1974:21). The original definition of the Tchula period was made by Phillips, Ford and Griffin (1951:431-436). In the intervening time a fair amount of work has been done on Woodland sites.

Chapman concludes that we are not yet able to separate the Early Woodland assemblages from the components preceding and following. At present there is considerable question if there is an Early Woodland period in Southeast Missouri (Chapman 1980:16-18). Recent work in northeast Arkansas, however, has identified ceramics which appear to be stylistically from this time period (Morse and Morse 1983; Lafferty et al. 1985) and J. Price (personal communication) have identified a similar series of artifacts in the Bootheel region. Artifacts include biconical "Poverty Point objects," cordmarked pottery with noded rims similar to Crab Orchard pottery in Southern Illinois and the Alexander series pottery in the Lower Tennessee Valley, and Hickory Ridge points. We believe that several of the sites tested in the current survey (3MS21, 3MS119, 3MS199 and 3MS471) have Early Woodland components in them.

Middle Late Woodland periods (150 B.C.- A.D. 850) was a period of change. There is evidence of participation in the "Hopewell Interaction Sphere" (dentate and zone-stamped pottery, exotic shell; Ford 1963) and horticulture is increasing (corn, hoe chips and farmsteads). There is some mound construction notably the Helena mounds at the south end of Crowley's Ridge (Ford 1963) indicating greater social complexity. Typical artifacts include Snyder, Steuben, Dickson and Waubesa projectile points, and an increasing number of pottery types (cf. Rolingson 1984; Phillips 1970; Morse and Morse 1983). In the late Woodland there is an apparent population explosion as evidenced by a great number of sites with plain grog-tempered pottery in the east and Barnes sand-tempered pottery in the west of the Central Valley (cf. Figure 18; Morse and Morse 1983; Chapman 1980). There is some evidence of architecture (cf. Morse and Morse 1983; Spears 1978) in this period as well as mound center construction (Rolingson 1984). A number of large open sites have not been excavated. There appears, therefore, to be a rather large bias in what we know about this important period toward the spectacular mound centers. There is still a great deal which is not understood about the cultural sequence and changes which came about during this important period. The Late Woodland in this area has been suggested as the underlying precursor to the Mississippian, which came crashing into the area with the introduction (invention ?; cf. Price and Price 1981) of shell-tempered pottery and the introduction of the bow and arrow around A. D. 850 (Figure 17).

The Mississippi period (A.D. 850-1673) is known from the earliest investigations in the region (Thomas 1894; Holmes 1903; Moore 1916), and has been the most intensively investigated portion of the prehistoric record in northeast Arkansas and southeast Missouri (Chapman 1980; Morse and Morse 1983; Morse 1982; Morse 1981; House 1982). Enough work has been done to define the spatial limits of phases (cf. Chapman 1980; Morse and Morse 1983; Morse 1981). During this period the native societies reached their height of development with fortified towns, organized warfare, more highly developed social organization, corn, bean and squash agriculture and extensive trade networks. The bow

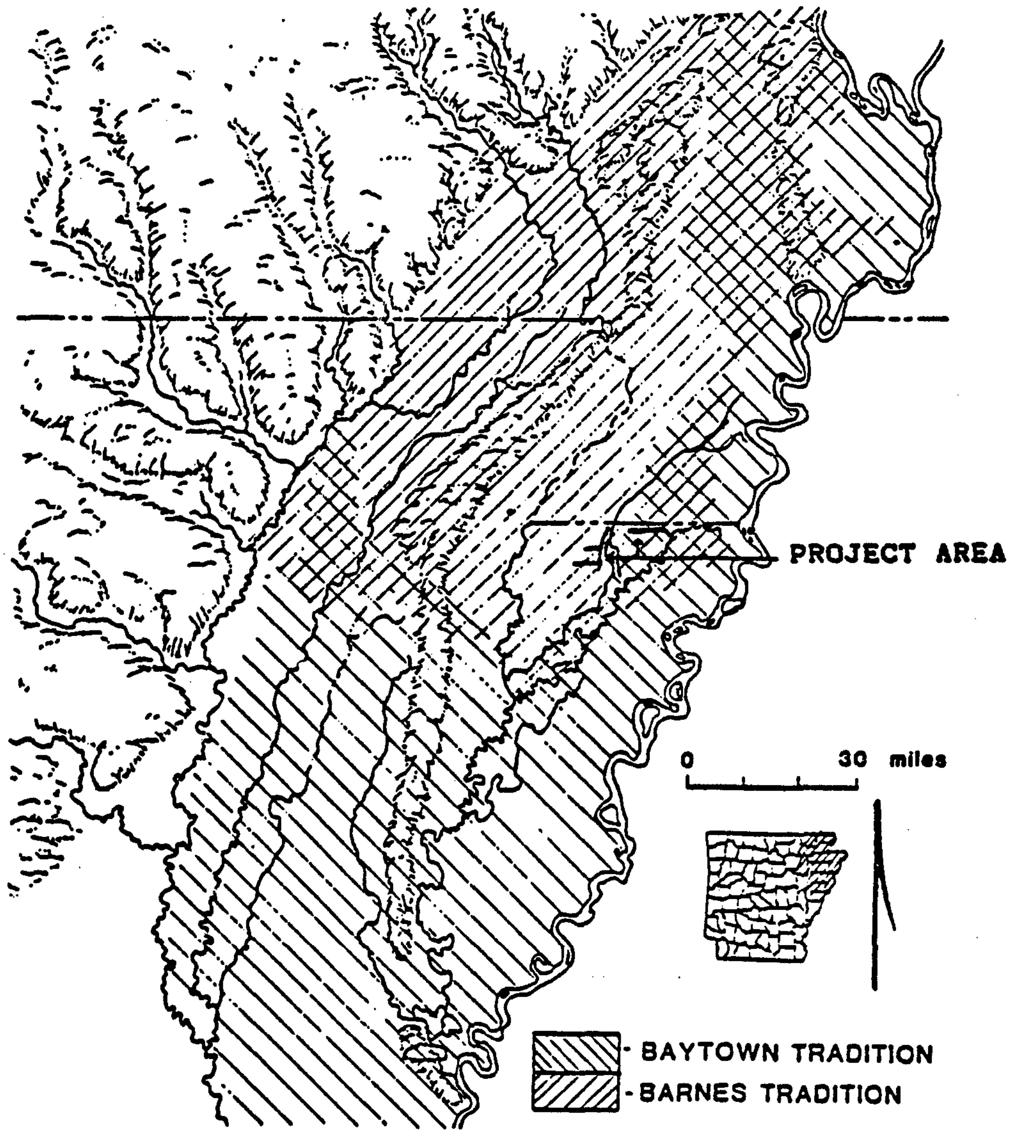


Figure 18. Woodland archeological manifestations, Central Mississippi Valley (after Morse and Morse 1983)

and arrow is common and there is a highly developed ceramic technology (cf. Lafferty 1977; Morse and Morse 1980; Smith 1978). This was abruptly terminated by tha DeSoto entrada in the mid-16th century (Hudson 1984, 1985; Morse and Morse 1983) which probably passed through the project area (Figure 19).

PROTOHISTORIC PERIOD

The DeSoto entrada resulted in the first recorded descriptions of Mississippi County, Arkansas, and the Mississippian Climax (Varner and Varner 1951; Hernandez de Biedma 1851; Elvas 1851; Oviedo y Valdes 1922). My interpretation of places follows Morse (1981) and Hudson's (1985) interpretations. In the summer of 1541 DeSoto was allied with the Casquians in a military expedition against the province of Pacaha. According to Morse:

> The large swamp up the Tyronza [between Tyronza Junction and Victoria in the southwest corner of the county] is a suitable candidate for the boundary between Casqui and Pacaha. Pecan Point, a Nodena phase village near the Mississippi River [southeast of Wilson], could probably be the location of the capital of Pacaha. It was an impressive site producing numerous fine pottery specimans, and is located an appropriate distance from Parkin. An expedition left Pacaha for an area "40 leagues distance" to get salt and yellow metal (Varner and Varner 1951:449). The only area where both salt and copper occur together in large amounts is in southeast Missouri, within easy reach of the Nodena phase [which occupied most of Mississippi County east of Big Lake, Figure 19]. Mountains also occur here as observed by the Spanish (1981:68).

Sometime as the Spanish crossed the swamp of the Tyronza Sunk Lands Mississippi County passed from the mists of prehistory into the annals of history. The expedition pushed north from Parkin covering about 15km per day. After three days of march the Spaniards,

> . . . came to a swamp that was very difficult to cross; for there were great morasses at its entrances and exits, and, in its center, water which though clean was so deep that for a distance of twenty feet it had to be swum. This swamp formed the boundary between the two enemy provinces of Casqui and Capaha. The men crossed it on some very unstable wooden bridges discovered there, and the horses swam, but with great difficulty because of the pools of stagnant water lying near the banks on both sides. The whole of the fourth day was occupied in making this crossing, and then both the Indians and Spaniards camped in some beautiful and very peaceful pasture lands a half-league distant [near Joiner] (Varner and Varner 1951:436).

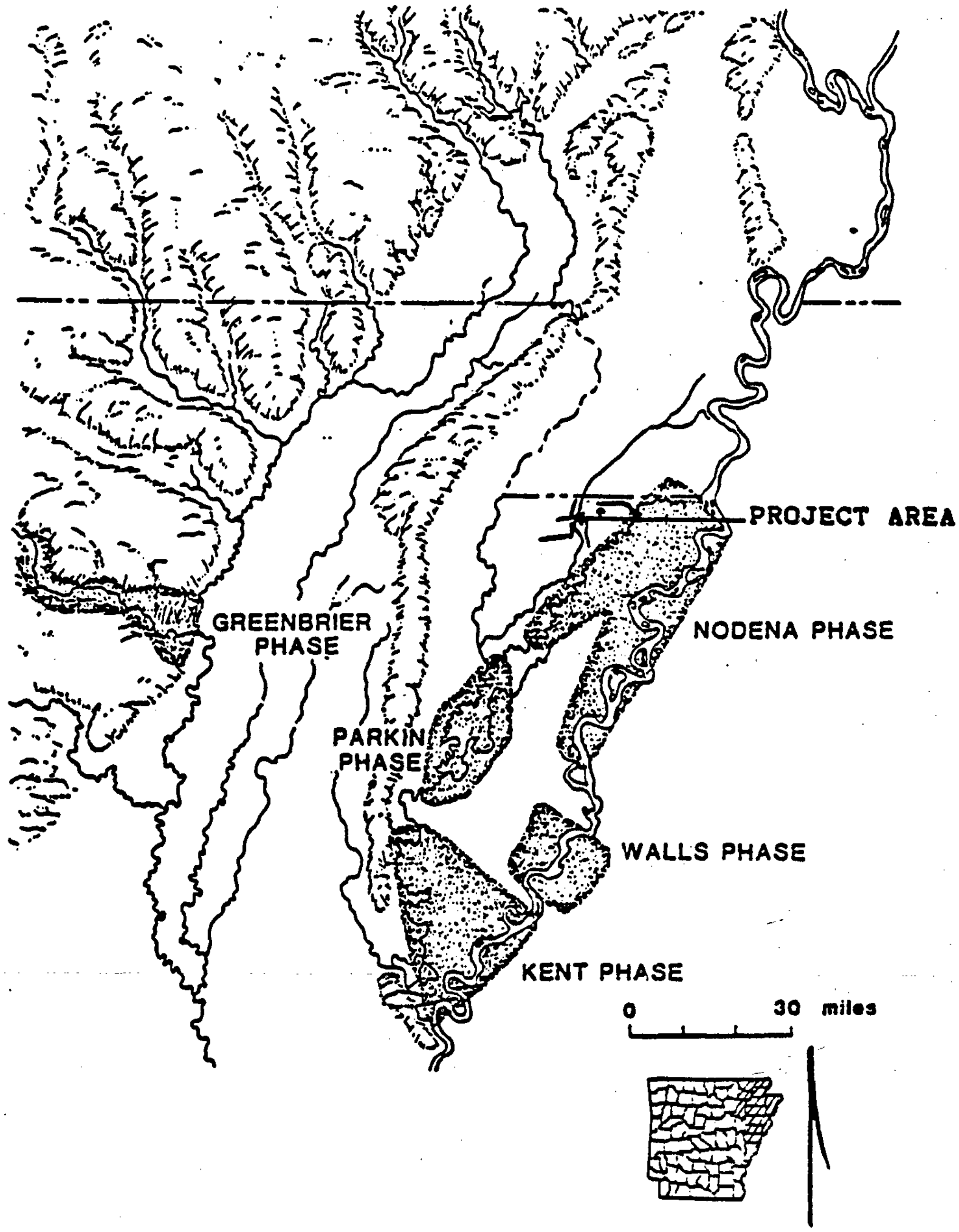


Figure 19. Late Mississippian manifestations in Northeast Arkansas (after Morse and Morse 1983)

And thus the wetness of what was to become western Mississippi County passed into the records of mankind. At this time, as was alluded to above, the province of Pacaha (Capaha in Varner and Varner 1951, the different provinces have different spelling in the different accounts) was one of the most powerful polities in North America. Archeological evidence suggests that it controlled the eastern half of Mississippi County as well as the Mississippi River trade. The "Capitol" was probably at the former site of Pecan Point which the Spanish describe as follows:

> It consisted of five hundred large and good houses, which were located on a site somewhat loftier and more eminent than its surroundings, and it had been turned into almost an island by means of a man-made ditch or moat ten or twelve fathoms deep and in places fifty feet wide, but never less than forty. The moat was filled from the previously mentioned Great River, which flowed three leagues above the town; and the water was drawn into it by human effort through an open canal connecting it with the river, a canal which was three fathoms deep and so wide that two large canoes went down and came up it side-by-side without the oars of the one touching those of the other. Now this moat, of the width we have said, lay on only three sides of the town, for it was as yet incomplete. But the fourth side was fenced off by a very strong wall of thick wooden boards that were thrust into the ground, wedged together, crossed, tied and then plastered with mud tamped with straw in the manner we have described farther back. The great moat and its canal contained such a quantity of fish that all the Spaniards and Indians who accompanied the Governor [almost 9000 all together] ate them until they were surfeited, and still it appeared as if they had not taken out a single fish (Varner and Varner 1951:436).

Therefore at the height of the Mississippian the natives of Mississippi County were already engaged in the construction of hydraulic works, which in the the present century have come to dominate the landscape. After this brief glimpse of the fully adapted Mississippians at the height of their power and glory in the 16th century, Mississippi County once again slipped into the mists of time.

<u>Historic Period (1673-present)</u>. After the DeSoto expedition the area was not visited until the French opened the Mississippi valley in the last quarter of the 17th century. The Indian societies were a mere skeleton of their former glory and the population a fraction of that described by the DeSoto chronicles. Marquette, in his rediscovery of the Mississippi for the French, did not encounter any Indians between the Ohio and the Arkansas rivers. He described this section of his journey south of the Ohio River as follows:

> Here we Began to see Canes, or large reeds, which grow on the banks of the river; their color is a very pleasing green; all the nodes are marked by a Crown of Long, narrow, pointed leaves. They are very high, and grow so thickly that The wild cattle have some difficulty in forcing their way through them.
>
> Hitherto, we had not suffered any inconvenience from the mosquitoes; but we were entering their home, as it were. . .
>
> We thus push forward, and no longer see so many prairies, because both shores of The river are bordered with lofty trees. The cottonwood, elm, and basswood trees there are admirable for Their height and thickness. The great numbers of wild cattle, which we heard bellowing, lead us to believe that The Prairies are near. We also saw Quail on the water's edge. We killed a little parroquet, one half of whose head was red, The other half and The Neck was yellow, and The whole body green (Marquette 1954:360-361; strange capitalization in the French original).

During the French occupation most of the settlements were restricted to the major river courses with trappers and hunters living isolated lives in the headwaters of the many smaller creeks and rivers. The St. Francis River was one of the earliest explored tributaries of the Mississippi River in the Lower Mississippi Valley and appears on some of the earliest French maps.

EARLY AMERICAN SETTLEMENT

In 1803 the French sold the Louisiana Territory to the United States. This included what would someday be Arkansas. The territory was administered from the territorial capital in St. Louis. In 1819 Arkansas Territory was established with its capital at Arkansas Post, the most ancient French settlement in the state (Ross 1969:8). The seat of government was moved to Little Rock in 1821, and in 1836 Arkansas was admitted to the union as a slave state.

Mississippi County is about 865 miles square and derives its name from the Mississippi River which forms its eastern border (Goodspeed 1889: 445; Edrington 1962: 21). The county was once part of Arkansas County, then became part of Phillips, and then Crittenden. It was designated as a separate county by the Territorial Legislature on November 1, 1833 (Goodspeed 1889: 445). During the legislative session of 1901, Mississippi County was subsequently divided by special act into two judicial districts with Blytheville and Osceola as court seats to expedite land transactions during the wet seasons (Fox 1902: 45).

The first representative of Mississippi County after the admission of Arkansas into the union in 1836, was P.H. Swain, from whom Swain township received its name (Goodspeed 1889: 451, 457). There were no post offices in Mississippi County before 1836. In Crittenden County Buford's Landing was established as a post office on April 1, 1833 (Wade 1974: 12).

The passage of the stern-wheel steamboat, "Orleans", from Pittsburg to New Orleans in 1812 was to presage great changes coming to the Louisiana Territory. This boat and the many others to follow used wood to power their steam engines and thus created a demand for cordwood. The early settlers along the river chopped and sold wood to such steamboats (Edrington 1962: 49). Perhaps more important, it made two-way transportation on the great river roads of the interior much faster and more reliable, when the rivers were up.

At first the only settlers in this part of the country lived in cabins surrounded by clearings along the river. In 1834, according to Joseph Hearn, there were no more than half a dozen clearings, all on the river from the lower end of the county to Mill Bayou. At the present site of Osceola lived a man named Hudgens, up river was Thomas J. Mills, and on what later became Fletcher's Landing was a Mr. Penny (Goodspeed 1889: 451, 452). As early as 1823, however, General Land Office maps show that there were settlers near Frenchman's Bayou. A survey of that area shows 12 separate fields whose owners were named (Morse 1976: 19). Thomas Nuttall, traveling in this area in 1819 reported that he came to within fourteen miles of the mouth of the St. Francis River and saw a few log cabins along the bank (Thwaites 1905: 89). In 1815 Lorenzo Dow, the famous itinerant Methodist preacher, traveled through Mississippi County on a government boat. He said that the country was "...inhabited by Indians, and white people degenerated to their level..." (Goodspeed 1889: 452; Gillespie 1978: 100). Carson's Lake Township and Kellum's Ridge were named for settlers in Mississippi County named Carsons and William Kellums, who were here as early as 1812.

The Euro-American occupation of the Central Mississippi Valley proceeded overland down Crowley's Ridge and slowly spread out from the rivers. Ports were established at Piggott on the high ground of Crowley's Ridge in the St. Francis Gap in 1835. It was located on the Helena-Wittsburg road which ran down Crowley's Ridge (Dekin et al. 1978:358). All of the settlements in the 1830s between Piggott and Helena in the St. Francis Basin were either along the rivers or on Crowley's Ridge. Towns continued to be founded in these environments into the early 1900s. Settlements away from the rivers along overland roads began in the 1850s and greatly accelerated with the construction of the railroads, levees and drainage ditches in the late 19th century.

In 1836 Arkansas was admitted to the Union as a slave state. Additional settlers in Mississippi County were planters from older slave states who came looking for fresh land and brought their slaves with them. The institution of slavery was economically profitable and it tied this part of Arkansas to the South socially, politically and economically (Herdon 1938: 18). There was no census for Arkansas for the years 1790, 1800, 1810, or 1820. The first federal census taken for Mississippi County was in 1840. Residents who were in the same place in 1830 are listed in the Crittenden County federal census for 1830 (Wade 1974: 12, 38). In 1840 there were 1,410 people, 900 whites and 510 slaves, and a school with 25 students near the Elizabeth Carnell house. In 1854 the population was 2,266 with 541 slaves. By 1860, the population had increased to 3,895 (Wade 1974: 38; Goodspeed 1889: 458, 459). In 1860 , for all townships in Mississippi County the number of slave houses was 235, the number of male slaves, 766, and the number of female slaves was 715, the number of owners was 78 (Wade 1974: 69).

One of the earliest settlements in this territory was Osceola on the edge of the Mississippi River. It was founded in 1833, and its population was 250 in 1840. J. W. DeWitt, the postmaster and first schoolteacher in the county, used a crackerbox for the mail (Fox 1902: 29; Goodspeed 1889: 453).

Settlement and enterprise were still concentrated in areas near and along the Mississippi River and accessible tributaries. Swamplands in the north (Big Lake) and southwest (Tyronza) parts of the county and flooding from the river presented a formidable obstacle to further settlement of much of this land. The Mississippi River flood plain was almost wilderness and practically uninhabited. Streams and bayous were the only arteries for travel through this swampscape more than half the size of New Jersey. Settlement in the interior of the county took place on drier areas near streams. Manila was founded in 1852 as the port of access to Buffalo Island on the Little River. Blytheville was founded in 1853 on Pemiscot Bayou (Dekin et al. 1978:358). Low-lying areas in the interior were often flooded and were unsuitable for agriculture. These areas were dominated by vast virgin Southern Floodplain forests. Mississippi County was cut off by these to the north, west and south for the last half of the 19th century (Goodspeed 1889: 446).

LEVEE CONSTRUCTION

In 1850 the U. S. Congress passed the Arkansas Swamp Land Act, in which overflowed lands in southeast Arkansas were given to the state to sell. The proceeds would pay for levees and drains to reclaim the land (Harrison and Kollmorgen 1948: 20-52). In 1852, sixteen miles of levee in the southeastern part of the county were built from the sale of these lands. During the Civil War the levees were not maintained; in fact, they were sabotaged (Morse 1976: 20). In 1879 Congress created a seven-man Mississippi River Commission, the president to be from the Army Corps of Engineers, and in 1881, it made the first appropriation of $1,000,000 under the Rivers and Harbors Act to start building levees. The levees would make hundreds of thousands of acres of rich and fertile land available for cultivation; they would increase the taxable property of the county and open up large areas for settlement (Goodspeed 1889: 459, 460). Levee work started in 1882 (Edrington 1962: 63) but floods in 1882, 1883 and 1884 were disastrous and curtailed all growth, development, and prosperity. Many farms and new clearings were abandoned (Goodspeed 1889: 459).

From 1865 to 1890 thousands of Irish laborers were brought in to supplement the Black manpower for the purpose of building levees. The Irish sublet 100 foot stretches of levee from the levee contractor. Their construction work was known as the "...'three M' method...Men, Mules and Mud". Later the Irish helped to build the railroads in northeast Arkansas. "Their unknown and unmarked graves dot the right-of-way of all our early railroads and levee lines" (Edrington 1962: 63; Sartain n.d.: 30). In 1893 the St. Francis Levee Board was organized and empowered by the Legislature to issue bonds and collect taxes to build a levee along the entire front of the St. Francis Basin to protect it from overflow (Fox 1902: 16).

The late 1800s saw men with few resources settle here who would make themselves prosperous and Mississippi County the world's biggest producer of cotton. John B. Driver from Americus, Georgia, married Captain Bowen's daughter, and began by buying 160 acres. He later bought land in all parts of the county. He was elected state senator and employed and provided for sixteen families. W. H. Grider used advanced farming and stock raising techniques, and became a substantial community figure. By 1889 Major Ferguson and Colonel Craighead had large plantations south of Osceola. Colonel Craighead had liberal and far-seeing ideas about land ownership and tenant farming. Robert E. Lee Wilson began with a small amount of land and timber and became a millionaire and a world-renowned planter. Probably, more than anyone else, he was responsible for getting the swamps drained, clearing the timber and bringing in the railroad, which transformed the landscape and brought commerce and development to the backwoods (Dew 1968: 39; Memphis Commercial Appeal, April 22, 1973; Goodspeed 1889: 454-489).

RAILROAD

In 1893, with the establishment of the levee districts, people began to come back to Mississippi County believing that flooding would soon end. Transportation was still mainly on water (Dew 1968: 23). Steamboats floated crops, furs, bear oil and timber down to Marked Tree for shipment to Memphis and New Orleans (Edrington 1962: 49). There were few roads in the eastern part of the county and these were impassable in wet weather. There were no roads in the Sunk Lands, where ox teams were used to bring logs out. The Cotton Belt, the Iron Mountain, and the Frisco railroads all went around the western and southern border at Paragould, Jonesboro and Marked Tree. R. E. L. Wilson, who had bought a sawmill, began hauling his timber by a short line railway that he built. In 1889 his mill at Idaho Landing (near Wilson) had a capacity of 14,000 feet a day, and he was shipping

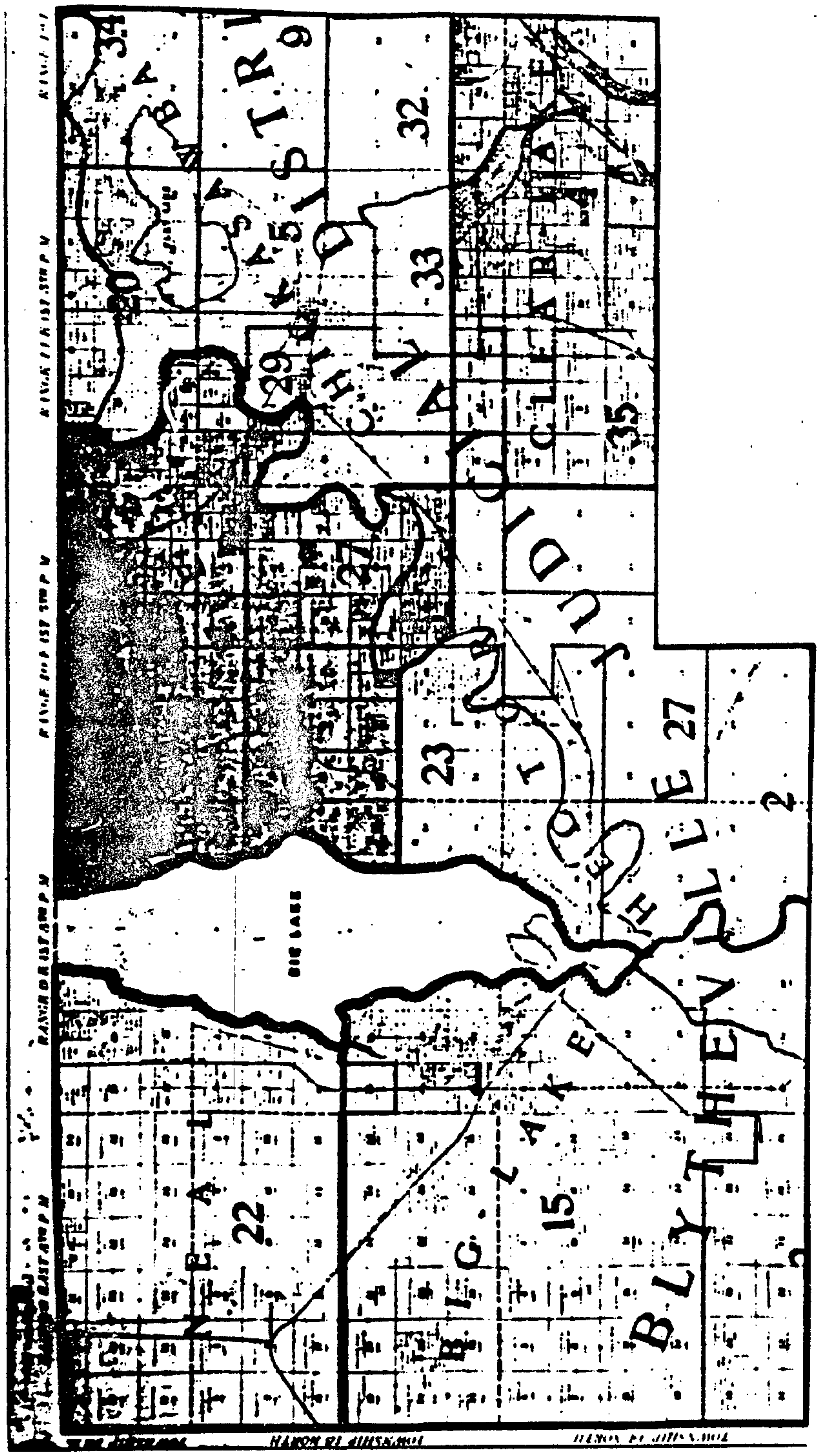


Figure 20. Project area in 1903 just after the construction of the Railroad. Only 25 miles of ditch had been constructed, all in the south part of the county. (after Sartain n.d.)

son) had a capacity of 14,000 feet a day, and he was shipping large quantities of lumber to Chicago annually (Goodspeed 1889: 568, 569). In 1896 the Railroad Commission of Arkansas issued a charter to the Jonesboro, Lake City and Eastern (J.L.C.&E.) Railroad Company to bring out timber from the sunk lands. The Craighead County Sun said in 1897 " ...it is opening up one of the most alluvial sections of the South and a timber belt that is unsurpassed anywhere" (Dew 1968:25). The wooded area of Arkansas was greater than that of any other state in the union (Fox 1902: 18).

The coming of the railroad caused a population boom in the Sunk Lands. By 1902 the railroad had crossed Big Lake and had reached Blytheville, making millions of acres of timberland available and creating new towns all along the railroad line Figures 20 and 21). Roads, wagon trails and narrow gauge train railways like spokes came out from the logging settlements encouraging trade and more settlement. Logging became the main industry and created associated industries: box plants, barrel stave factories, a planing mill, a shingle mill and a wagon and buggy manufactory (Dew 1968: 27; Goodspeed 1889: 489; Fox 1902: 29-30). Railroad crossties used throughout the nation came from Buffalo Island (Dew 1968: 27). In 1902 there were 35 sawmills producing from 3,000 to 70,000 feet of lumber a day. The largest sawmill operator in the county was the Chicago Mill and Lumber Company owned by Governor Frank Lowden of Illinois (Fox 1902:18).

In 1911 Lee Wilson bought controlling interest in the J. L.C. & E. Railroad and merged it with the 10-mile-long Wilson and Northern Railroad which he had built, resulting in 96.4 miles of J. L. C. & E. mainline track. Both the Craighead County Sun(1900) and the Jonesboro Tribune (1906) hailed him as a progressive businessman.

SWAMP DRAINAGE AND ITS EFFECTS

Efforts begun in 1902 to establish drainage districts failed again and again, hampered by actions of big lumber interests. Lumbermen were not concerned with it and farmers did not want to pay the tax, although small, that would be levied for such an undertaking. Otherwise sane and upstanding citizens engaged in fist fights and brandished knives. Ultimately, over a period of years the violent objections led to an attempted lynching of Judge Logan D. Rozelle and Lee Wilson. In spite of the violence and the obstacles, drainage districts were finally established. The Office of Drainage Investigation in Washington, D. C., called it the "largest and best planned and most economically constructed drainage district in the United States" (Sartain n.d.: 6, 7).

In 1918 the J. L. C. & E. advertised that the final work in draining was being done, and by 1919 there was a land boom. Land sales were of no more than 80 acres each (Dew 1968: 15, 31), however; the land was cheap and fertile and it brought people who were anxious to farm it. Insisting that "...the plow should

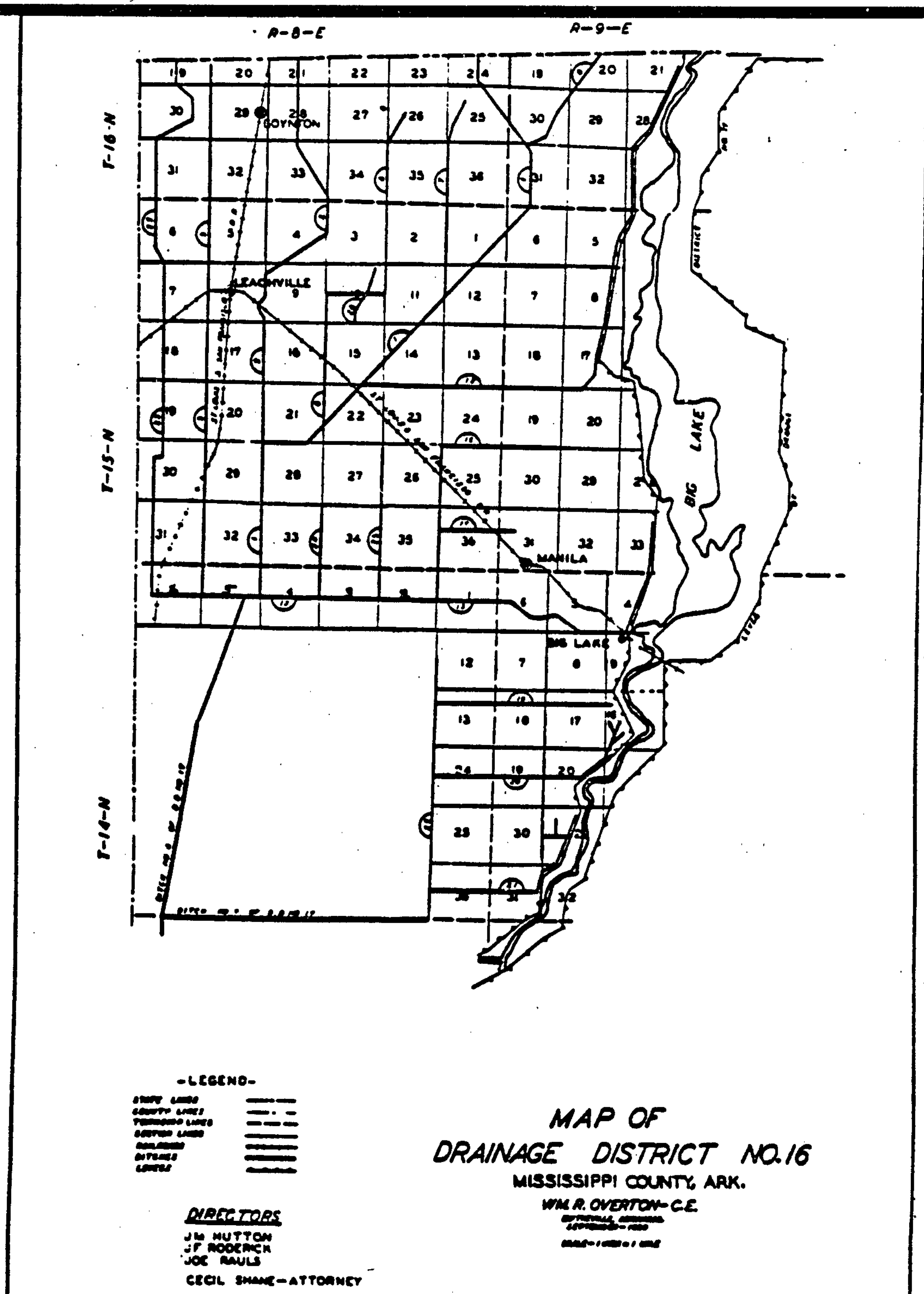


Figure 21. Ditches planned in Mississippi County. Note that on this map, presumably dating to 1901 or 1902 the railroad has not been completed west of Manila. Also of note is the ditches planned to drain Big Lake Swamp which were eventually included within the levee.

follow the saw" (Lee Wilson and Companyn.d.), Lee Wilson acted on this belief and planted cotton on the deep alluvial soil. Other planters followed suit and by December of 1916, after World War I in Europe began to cause agricultural prices in the United States to rise, the railroad shipped 38 carloads of cotton valued at $238,000 on a single train—a record for a shipment from the Sunk Lands. Still later, in 1919, the all-time record for a single J. L. C. & E. freight lading was set when R. E. L. Wilson shipped 6500 bales of cotton valued at one million dollars on a special train. It took 600 pickers two months to pick the crop (Dew 1968:31). A framed photograph of this train with its load of cotton is proudly displayed in the offices of the Delta Valley & Southern, affiliate of the Lee Wilson Company in Wilson, Arkansas. The caption reads:" J. L. C. & E. 1919 MILLION DOLLAR TRAIN" (Hope Gillespie, personal observation). By the end of World War I logging was outdistanced by agriculture. Part of the reason was that timbering was a finite process, and railroads hastened the cutting and the disappearance of the great hardwood forest (Dew 1968: 31).

When cotton prices dropped in 1920, Lee Wilson led the farmers in experimenting with other crops. Wheat, soybeans, corn, cantaloupes, sweet potatoes, hay, and alfalfa became only some of the valuable alternatives to cotton. Planters used tenant farmers to plant and harvest. James Craighead's opinions on tenants and land ownership were quoted widely by authors at the turn of the century. He believed that large land holdings were a "drawback to prosperity" and that when owners divided their land and financed it on a long term basis to permanent settlers, everyone profited. People became responsible when they owned the land (Goodspeed 1889:485; Fox 1902:47-50). Most of the farming in eastern Mississippi County in the early 20th century was done by Black tenants. On Buffalo Island farming did not really begin until the timber companies began to sell off their holdings after exploiting the timber. This is exemplified by the history of the landholdings on the project area historic sites as outlined below.

BACKGROUND ON HISTORIC SITES

by

Beverly J. Watkins

The historic sites in the project area fall into three categories:

First are sites 3MS473 and 3MS474. These sites are on such undesirable land that they were never claimed from the state. By 1935 they had come under the control of Drainage District #12, but have since been transferred to the Arkansas Game and Fish Commission as part of a wildlife refuge (Mississippi County Real Estate Tax Records, Osceola 1879-1905; Mississippi County Real

Estate Tax Record, Blytheville 1908-1940).

The second group includes sites 3MS199, 3MS471, 3MS119, 3MS21, and 3MS472. These sites are all on lowlands that became available for purchase under the Swamp Land Act of 1850. On 12 July 1852 Dozier Thornton of Cherokee County, Alabama, Jeptha Fowlkes of Shelby County, Tennessee, and J.W. Lumpkin (residence unknown) entered 52,928 acres of Mississippi County in Thornton's name. The men paid $32,798 for this land. Between 1852 and 1858, Fowlkes bought out Lumpkin's share; and Dozier Thornton sold his share to N.M. Thornton of Cherokee County, Alabama, and H. Smith of Mobile County, Alabama. On 10 December 1858 an agreement was drawn up to divide the land. N.M. Thornton and H. Smith got 20,315 acres including 3MS21; Fowlkes got 25,919 acres including 3MS119 and 3MS472. The last 6,775 acres, including 3MS199 and 3MS471, was to be held jointly to secure the debt remaining from the original purchase. On the same day Fowlkes executed a deed to Thornton and Smith for their portion of the division (Mississippi County Deed Record, Osceola 1:516-519, 520-525.

Fowlkes died in 1863. His heirs were unable to pay the debts on this parcel of his land, so in 1869 it was sold on the steps of the courthouse in Memphis. The buyers were Smith and Thornton who acquired Fowlkes portion of the 1858 division of property, as well as full title to the lands that were held jointly (Mississippi County Deed Record, Osceola 2:277-282).

Whatever plans these investors had for their Arkansas lands did not work out. On 7 December 1874, H. Smith, living in New Orleans, sold 44,991 acres in Mississippi County as well as land in Craighead County to J. Morgan Smith of Talladega, Alabama, for $1500 (Mississippi County Deed Record, Osceola 6:99-105). J. Morgan Smith then joined John T. Burns to form the mercantile business of Smith & Burns, probably using a mortgage on Smith's land in Mississippi County for capital to get the company started (Mississippi County Deed Record, Osceola 6:136-140). More money was needed, and on 13 September 1875 they mortgaged all of their land in Craighead, Mississippi, Greene, and Clayton (now Clay) Counties to Charles Hodgman of St. Louis, with Leonard Matthews and Edward Whitaker of St. Louis as trustees to oversee the repayment of the debt (Mississippi County Deed Record, Osceola 6:219-223, 236-245).

By 1876 Smith & Burnes had established stores in Osceola and on Big Lake. Smith, who had been living in Osceola, decided to return to Talladega, Alabama, and gave Burns his power of attorney over all "land, houses, and real estate," with specific authority "to rent and collect rents" on the land until it could be sold (Mississippi County Deed Record, Osceola 6:376-77). The business did not prosper, however, and on 3 June 1876 the land went to Leonard Matthews and Edward Whitaker, doing business as Matthews & Whitaker, to satisfy the 1875 mortgage (Mississippi County, Osceola 7:17-20).

Matthews & Whitaker soon began selling their extensive properties, so from this point each of the five sites has a slightly different history.

Twenty-six acres which includes 3MS199 were sold by Matthews and Whitaker to Burel Kilen on 15 December 1884. Because the amount was $1 and "other valuable considerations" Kilen may have been either a relative or an employee. The deed was endorsed by Kilen's heirs as being transferred to John Spears on 16 July 1885 (Mississippi County Deed Record, Osceola 17:611). Spears then sold the property to William H. Harrison for $3000 on 22 February 1888 (Mississippi County Deed Record, Osceola 15:71). Harrison remained the owner until about 1914 when the taxes are shown as owed by Zebro Harrison, probably an heir. By 1920 the property was no longer listed on the tax books (Mississippi County Real Estate Tax Records, Blytheville 1913-1940).

When the logging boom reached the area in the early 1900s, the Buckeye Lumber Company bought a great deal of land in Mississippi County. Matthews & Whitaker sold 3MS471 to Buckeye Lumber in about 1905 (Mississippi County Real Estate Tax Records, Osceola 1905). Once the timber was cut from a parcel of land, the lumber company would sell it, usually to a farmer. In this case T.A. Neal owned the land by 1913, but probably lost it for not paying a mortgage. In 1925 the Bank of Hornersville, Missouri, transferred the land to W.W. Langdon (Mississippi County Real Estate Tax Record, Blytheville 1913, 1925, 1940).

Matthews & Whitaker owned 3MS119 until about 1905 when it went to A.E. Marshall (Mississippi County Real Estate Tax Records, Osceola 1905). The property went to the Buckeye Lumber Company by 1908. By 1913 it had been purchased by W.W. Brewer; going to L.A. Brewer, probably an heir, in about 1930 (Mississippi County Real Estate Tax Records, Blytheville 1908-1940).

Site 3MS21 went to the Buckeye Lumber Company in about 1905 (Mississippi County Real Estate Tax Records, Osceola 1905). By 1913 it had been sold to J.E. Miller; then shortly thereafter to L.C. Henley. G.W. Bowman acquired the property in 1920, and remained the owner until at least 1940 (Mississippi County Real Estate Tax Records, Blytheville 1908-1940).

Finally, 3MS472, the last site in this category, also went to Buckeye Lumber in about 1905 (Mississippi County Real Estate Tax Records, Osceola 1905). By 1913 it had been transferred to the Barron & Fisher Land Company. W.I. Hayes bought the land in about 1920, but by 1930 it was owned by the Monarch Investment Company. By 1940 this property was owned by J.C. Steele (Mississippi County Real Estate Tax Records, Blytheville 1908-1940).

The last site, 3MS478, has a different history from the others, and so is in a category by itself. Under the Swamp Land Act of 1850, persons who built levees or drains to reclaim swamp lands could be rewarded by the state of Arkansas with scrip which could be used to purchase other land. George W. Underhill was a contractor who built a line of levees along the Mississippi River in the early 1850s, and so accumulated a large amount of swamp land scrip. In 1852 Underhill sold $30,000 worth of that scrip to Jeptha Fowlkes. The agreement was that Underhill was to use the scrip to purchase certain lands, including 3MS478, and then deed those lands to Fowlkes. An agent, Jo Williams, was chosen to select the lands, and Fowlkes paid for the scrip. Unfortunately, Underhill died in 1854 before he could execute a deed for the lands to Fowlkes. The administrators of Underhill's estate issued a certificate of purchase to Fowlkes on 24 April 1855, and directed Jessie Jackson, the U.S. land agent at Helena to take care of the problem and to issue the proper titles to Fowlkes. For some reason this was not done.

The Civil War intervened, and Fowlkes died in 1863. In 1867, David C. Cross, presented himself to the Auditor of State in Little Rock as the assignee of the title to the same lands, and although he was unable to produce affidavits or other evidence of his right to title of these lands, deeds were issued in his name. Cross owed money to the Citizens Bank of New Orleans, and under a judgement from a federal court Cross' title passed to the bank to satisfy his debt.

Meanwhile, Fowlkes' heirs sued the bank to regain title to the lands. In May 1880 the Mississippi County Circuit Court ruled that the Fowlkes heirs were the rightful owners of the property and ordered the state to cancel the deeds issued to Cross (Mississippi County Deed Record, Osceola 13:211-217).

On 11 August 1882 the Fowlkes heirs, widow Sarah W., sons Jeptha M., and David, daughters Maggie C., Edna A. Hatcher, and Annie L. Hayden, and Daniel H. Hayden, Annie's husband, all of Shelby County, Tennessee, sold large amounts of land in Greene, Craighead, and Mississippi Counties to Horace Allen of Indianapolis for $1. Four months later they sold another large parcel of land to Allen through his agent J.J. Mitchell (Mississippi County Deed Records, Osceola 11:501-512). On 17 June 1884 Mitchell, acting for Allen, sold both parcels of land to Andrew Whitten of Couston Newtyle, County of Forfor, Scotland. The money, $1 per acre, was paid by Dundee Investments Limited, represented by John M. Judah, its attorney (Mississippi County Deed Records, Osceola 13:156-162, 180-184).

Whitten amassed large holdings in Craighead, Crittenden, Greene, White, Woodruff, and Mississippi Counties. He sold them all on 24 October 1890 to John M. Judah and Albert S. Caldwell of Memphis, doing business as Caldwell & Judah, for $1 (Mississippi County Deed Record, Osceola 15:587-591). Caldwell & Judah in turn sold the property to James Haggert of Jackson County, Missouri, and William McMaster of Multnemah County, Oregon, on 11 February 1896, also for $1 (Mississippi County Deed Record, Osceola 18:533-535).

Haggert and McMaster soon sold 15,172 acres, including 3MS478, to Herman Paepcke of Chicago on 22 July 1899. Paepcke paid $15,091 in cash and issued $45,600 in notes payable in gold coin at the German National Bank in Little Rock (Mississippi County Deed Record, Osceola 23:540-544). Paepcke was just a middle man, however, for less than two weeks later he sold the property to the Chicago Mill and Lumber Company for $1 with the company to take over the promissory notes (Mississippi County Deed Record, Osceola 25:77-81).

Chicago Mill and Lumber kept the land until about 1913 when it was owned by Boyenton Land and Lumber. By 1920 it was owned by J.M. Hutton; by 1925 the owner was J.K. Rhodes; and by 1930 E.C. Stuck was the owner (Mississippi Real Estate Tax Records, Blytheville 1913-1940).

CONCLUSIONS

by

Robert H. Lafferty III

By 1945 much of timber had been cut off of Buffalo Island. In that year the USGS shows significant stands of timber still in the Buffalo Creek Valley, in the Arm of Big Lake and in the Eastern Big Lake floor, which have since been cut. In contrast with the Tyronza basin in Mississippi County, the timber companies that owned the timber rights sold the land, often to small land holders after the timber had been cut. Much of this was done in the 1920s and 1930s and resulted in a rural landscape with many different independent land holders. In the eastern part of the county settlement is older, and after the timber boom the large timber companies continued to hold the land, resulting in large plantations with share croppers and tenants.

CHAPTER 5

GEOMORPHOLOGY, SEDIMENTATION, AND CHRONOLOGY OF ALLUVIAL DEPOSITS DEPOSITS, NORTHERN MISSISSIPPI COUNTY, ARKANSAS

by

Margaret J. Guccione

INTRODUCTION

The Mississippi River and its tributaries have the largest alluvial valley in North America. This valley includes many environments rich in food, water, and material resources which man has utilized throughout most of the Holocene. Thus the area is rich in cultural materials and is the site of many archeological studies (Morse and Morse 1983).

In any region, including the Lower Mississippi Valley, archeologists are interested in the age of the underlying sediment and the landforms so that they can predict the probability of the presence of cultural materials and their maximum age. In this region Saucier (1981) has attempted to determine relative ages, and where possible, absolute ages of terraces, braided stream surfaces, meander belts, and subdeltas of the Lower Mississippi River (Figure 22). Though the general history of the valley has been determined, a detailed history and the absolute ages of events in the upper part of the lower valley has not been determined yet.

The purpose of this interdisciplinary study is to assess the probability of the presence of significant surface and buried cultural resources and the likely location and nature of these resources in the vicinity of Big Lake National Wildlife Refuge. Outcrops are almost nonexistent in the area and all stratigraphic, sedimentologic, and vegetational analyses have to be obtained by subsurface information. Therefore, a detailed examination of the geomorphology and sedimentology in Mississippi County, Arkansas was made using aerial photographs and cores. Geomorphology, lateral and vertical associations of environments, grain-size analysis, and sedimentary structures were all used to determine changing sedimentary environments through time and space. The location of river channels which could serve as water, food, material sources, and transportation pathways were particularly critical. Radiocarbon dating provided an absolute time frame for this sequence and pollen analysis provided a simultaneous vegetative history of the area.

STUDY AREA

The Lower Mississippi Valley has formed since the Eocene and the oldest alluvial sediment preserved in the valley was deposited prior to glaciation of the midcontinent, U.S.A. (Guccione et al. 1986). In Arkansas, preglacial (Pliocene?) sand and gravel are preserved on Crowley's Ridge, a high alluvial terrace (Figure 22). Subsequently, the ancestral Mississippi River incised a deep valley to the west of Crowley's Ridge (the Western Lowlands) and the ancestral Ohio River incised a deep valley to the east of the Ridge (the Eastern Lowlands). During the Pleistocene the rivers aggraded and braided channels deposited extensive sand. Subsequently, the rivers have degraded a portion of the old floodplain and formed terraces in the Western and Eastern Lowlands. Much of the valley fill and terrace formation was probably related to glaciation in the midcontinent (Saucier 1974) but the exact sequence of events remains to be determined. The Mississippi River permanently abandoned its channel on the west side of Crowley's Ridge and established a channel on the east side of the Ridge after deposition on the Illinoian Loveland Silt and prior to the deposition of the Roxana Silt (Guccione et al. 1986). During the Holocene the Mississippi River channel changed from a braided pattern to a meandering pattern and the style of sedimentation changed from extensive sand deposition in channels to both sand deposition in channels and silt and clay deposition in the backswamp.

Prehistoric man lived in the Lower Mississippi Valley and utilized its rich resources as early as 9,500 years B.P. (Morse and Morse 1983). These investigations suggest that the human population shifted out of the bottomlands into the uplands between 7,000 and 3,000 years B.P. because the climate became drier than that of the early Holocene. More moist conditions and the human population returned to the area during the past 3,000 years.

The study area is within the Lower Mississippi Valley in northeastern Arkansas (Figure 22). It extends from the town of Leachville in the west to Blytheville in the east of northern Mississippi County. The Arkansas-Missouri state line is the northern boundary and the southern boundary is the latitude of the south edge of Big Lake National Wildlife Refuge. This area encompasses portions of two very different geomorphic areas that are of contrasting ages, substrates, and ecologies. West of Big Lake is a relict braided stream "terrace" and beneath and to the east of Big Lake is the meandering stream level.

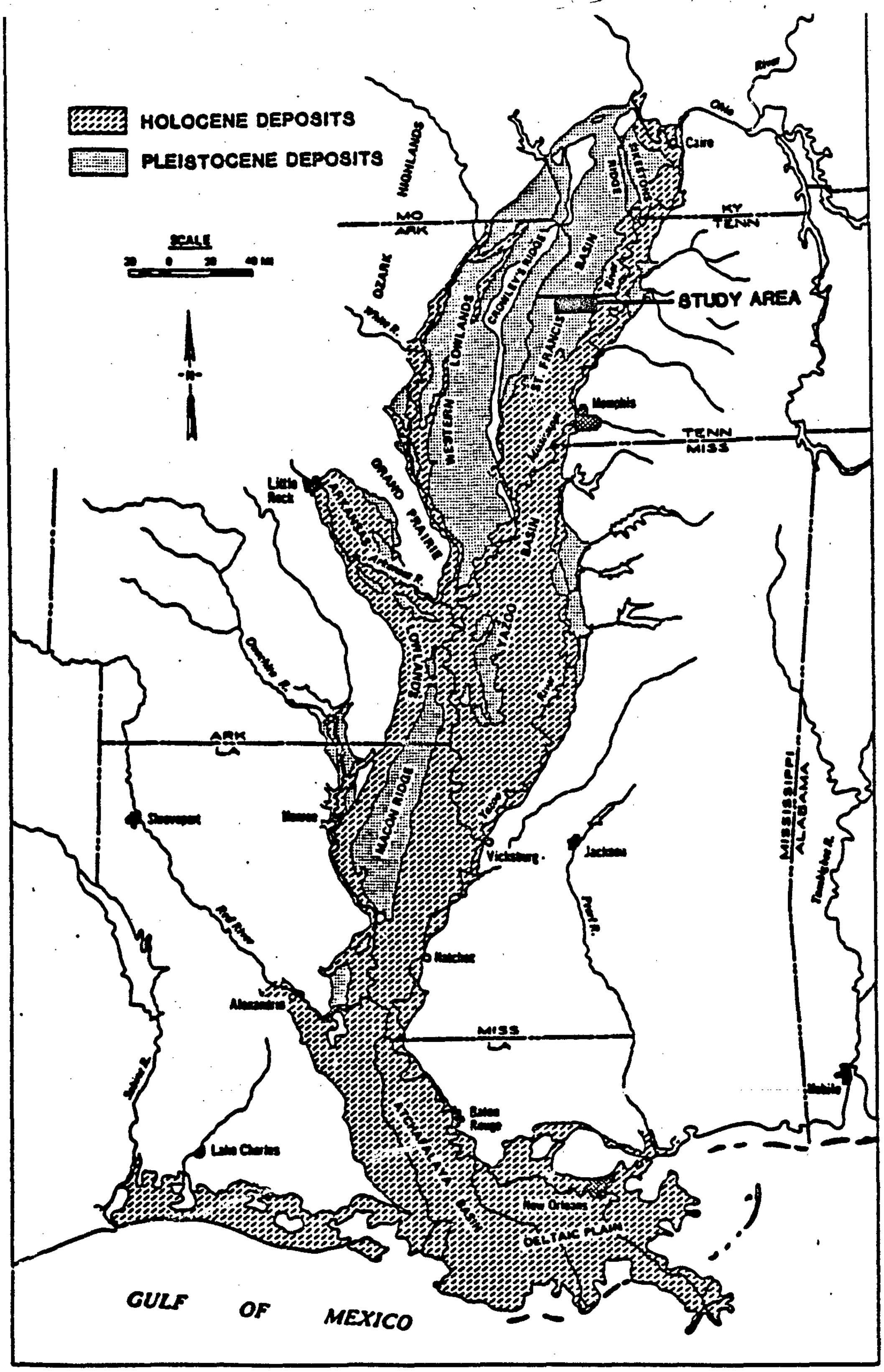


Figure 22. Location map of the study area and the Lower Mississippi Valley. (Modified from Saucier 1981, Figure 1).

METHODS

Geomorphic Map Units

This study included aerial photo examination and interpretation, field examination, and laboratory analysis of Quaternary deposits in northern Mississippi County, Arkansas. Initial interpretation of geomorphic units, the probable nature and environment of deposition of the surficial materials within each map unit, and the relative age of each unit was done using 1984 Arkansas Highway Department and 1966 Soil Conservation Service aerial photographs and maps of the distribution of alluvial deposits in the area by Saucier (1971) (Figure 23). Most map units were examined using 15 shallow cores (less than 2.5m deep), 2 hand-dug pits, and 5 outcrops (Appendix D). In addition 2 deep (6-7m) cores were taken using a split spoon sampler. The sites for the deep cores, Big Lake and Pemiscot Bayou, were chosen to sample a thick succession of poorly drained Holocene sediment that would likely contain fossil pollen for vegetation analysis and organic matter for radiocarbon dating.

Sampling

One hundred twenty-four samples from the cores, pits, and exposures were analyzed for grain size. The texture of at least one sample from each horizon of selected sites was determined. For thicker horizons multiple samples were taken at approximately 20 to 40cm intervals.

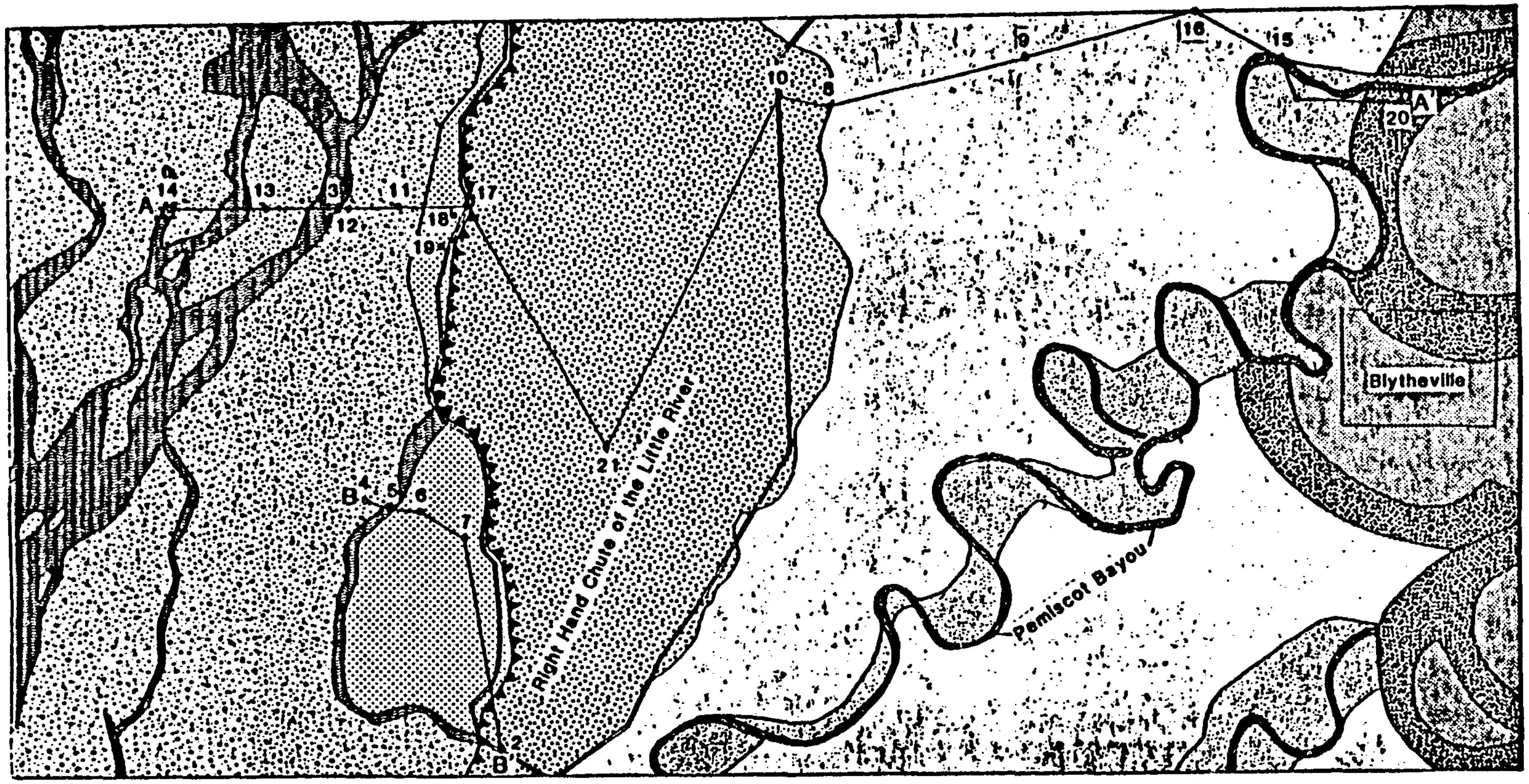
Five samples for radiocarbon dating were taken from the Big Lake and Pemiscot Bayou cores. Thick intervals of 61cm to 76 cm had to be used because the sediment had a low organic matter content. The sampling intervals were at approximately equally spaced depths from 152cm to the base of the cores. Thirty-five samples for pollen analysis were taken from the Big Lake and Pemiscot Bayou cores.

Core and Outcrop Description

The sediments were described using the 1981 draft revision of Chapter 4 "Examination and Description of Soils in the Field" (Soil Survey Staff 1981). Master soil horizon designations are capital letters (Table 6) and lower case letters indicate specific characteristics of the master horizons (Table 7). Numeral prefixes are used to designate major stratigraphic units which are identified by lithologic discontinuities. Unlike the standard soil description nomenclature, buried soils within a succession of lithologically similar strata were also given different numeral prefixes. This method of horizon nomenclature is more appropriate for the soil descriptions in this study because emphasis on both stratigraphic and pedologic horizons is enhanced. Numeral suffixes are used to designate subdivisions of a layer or horizon which is designated by a single combination of letters. Unlike the standard soil description nomenclature, multiple numeral suffixes were not used for multiple samples of a

Figure 23. Geomorphic map of the braided stream terrace and meandering stream level of the Mississippi River in northern Mississippi County, Arkansas. Numbers refer to the cores, pits, and outcrops listed below and described in Appendix D. Locations of cross sections AA' and BB' (Figure 24) are also shown. (Modified after Saucier 1964, Manila (a) and Blytheville (a) plates).

1. Air Strip Core
2. Big Lake Core
3. Bridge Area 2 Cut
4. Country Club 1 Core
5. Country Club 2 Core
6. Country Club 3 Core
7. Country Club 4 Core
8. East Big Lake Core
9. Hay House Core
10. Just East of Big Lake Core
11. Manila 1 Core
12. Manila 2 Core
13. Manila 3 Core
14. Manila 4 Core
15. Pemiscot Bayou Core
16. State Line Cut
17. West Big Lake Core
18. West Big Lake Test Pit #1
19. Wood Core
20. Yarbro Core
21. Zebree-Big Lake Core



LEGEND

Braided Stream Terrace

Holocene
- Braided Stream Channel-fill

Pleistocene
- Natural Levee
- Braided Stream
- Scarp Face
- Levee surrounding Big Lake National Wildlife Refuge
- • Core, pit, or outcrop

N

1 0 1 2 3 4 miles
1 0 1 2 3 4 5 km
SCALE

LEGEND

Meandering Stream Level

Holocene
- Crevasse Channel
- Crevasse Channel Point Bar
- Mississippi River Channel-fill
- Mississippi River Point Bar
- Backswamp
- Right Hand Chute of Little River Channel Complex

GEOMORPHIC MAP OF NORTHERN MISSISSIPPI COUNTY, ARKANSAS

Table 6. Letter designations for master horizons in soil descriptions (modified from Soil Survey Staff 1981).

Master Horizon	Description
O	Layers dominated by undecomposed or partially decomposed organic material which are surface layers or buried surface layers. This does not include limnic layers.
A	Mineral horizons which are surface layers or formed below O horizons. They have an accumulation of humified organic matter mixed with the mineral fraction or properties resulting from cultivation.
E	Mineral horizons which have lost silicate clay, iron, aluminum, or some combination of these, leaving a concentration of sand-sized or silt-sized quartz or resistant mineral grains.
B	Subsurface mineral horizons which formed below an A, E, or O horizon and are dominated by an obliteration of all or much of the original rock structure. There is also 1) an illuvial accumulation of silicate clay, iron, aluminum, humus, carbonates, gypsum, and/or silica, 2) a removal of carbonates, 3) a concentration or coatings of sesquioxides, or 4) granular, blocky, or prismatic structure.
C	Unconsolidated or poorly consolidated rock horizons or layers which are little affected by pedogenic processes. They may be mineral or organic (limnic) layers.
R	Hard bedrock.

Table 7. Letter designations for subordinate distinctions of master horizons in soil descriptions (modified from Soil Survey Staff 1981).

Subordinate Distinctions	Descriptions
b	buried horizon
c	significant accumulations of concretions or nodules of iron, aluminum, manganese, or titanium
g	strong gleying where iron has been reduced or removed resulting in a layer with low chroma and which may be mottled
p	plowing or disturbance of the surface layer
t	accumulation of silicate clay as coatings on ped surfaces, in pores, or as bridges between grains
w	development of color or structure in a B horizon which has little or no illuvial accumulation
x	fragipan which has a firmness, brittleness, or high bulk density developed by pedogenic processes and limited root penetration

layer because the many samples taken from thick horizons in this study would have made the numerical suffix designation too complex. Also unlike the standard soil description nomenclature, the numeral sequence is initiated with each new stratigraphic unit, even if it has a letter designation identical to the unit above. The succession of multiple stratigraphic units with the same letter designation in the study would not adequately emphasize the stratigraphic units. Textures in the soil descriptions are based on laboratory analyses where available. Soil colors are moist.

Size Analysis

For size analysis, approximately 25g of air-dried sample was gently disaggregated with a mortar and pestle. A sample-water slurry was suspended in a malt mixer for approximately 5 minutes. Fragments $\geq$ 0.0625mm were removed by wet sieving on a vibrator. Sand sizes (2.0-0.625mm) were separated into the very coarse sand fraction (2.0-1.0mm), the coarse sand fraction (1.0-0.5mm), the medium sand fraction (0.5-0.25mm), the fine sand fraction (0.25-0.125mm), and the very fine sand fraction (0.125-0.0625mm) by dry sieving in a ro-tap for 10 minutes. Particle size analysis of 3 silt fractions and 1 clay fraction was determined by standard pipette methods (Day 1965). The silt fractions are coarse silt (0.0625-0.016mm), medium silt (0.016-0.004mm), and fine silt (0.004-0.002mm). The clay fraction is finer than 0.002mm. The percentage of each fraction less than 2mm (sand, silt, and clay) was calculated. The percentage of gravel (> 2.0mm) compared to the total sample was also calculated.

Radiocarbon Analysis

Radiocarbon dates were provided by Beta Analytic on whole soil samples. Three dates were obtained from the Pemiscot Bayou Core and two dates were obtained from the Big Lake Core (Table 8). To obtain adequate carbon, the thickness of each sample interval was 61 to 76cm. Average sedimentation rates were calculated for each sedimentation interval between dated samples and for the entire core (Table 9). To calculate the sedimentation rates, the carbon 14 date was assigned to the mean depth of each sample interval (Table 8). The thickness between the mean depth of each sampled interval was divided by the difference between the ages of each sampled interval or the duration of sedimentation (Table 9). The age of each lithologic boundary present in the cores was estimated (Table 10). First the thickness of sediment above or below the mean depth of the radiocarbon sample interval was divided by the calculated sedimentation rate to determine the duration of sedimentation. Second, this length of time was added to the radiocarbon date if the date was stratigraphically above the lithologic boundary or subtracted from the date if the date was stratigraphically below the lithologic boundary. The estimates are rounded to the nearest hundred years. Age estimates are used in this report for the following reasons: multiple dates from a single core allow two (Pemiscot Bayou Core) or three (Big Lake Core) sedimentation

Table 8. Radiocarbon dates of Big Lake and Pemiscot Bayou Cores from the meandering surface near Blytheville, Arkansas.

Core	Depth (cm)	Mean Depth (cm)	C14 Date [yrs B.P] (Beta No)	Environment of Deposition
Big Lake	274-335	305	3,500±150 (17026)	natural levee
Big Lake	488-564	526	6,450±200 (17027)	backswamp
Big Lake	610-686	648	9,050±150 (17028)	backswamp
Pemiscot Bayou	152-213	183	3,160±110 (17029)	backswamp
Pemiscot Bayou	442-518	480	8,530±300 (17030)	natural levee and crevasse splay

Table 9. Sedimentation rates in the Big Lake and Pemiscot Bayou Cores, from the meandering surface near Blytheville, Arkansas.

Core	Mean Thickness (cm)	^{14}C Date (years B.P.)	Duration (^{14}C years)	Mean Sedimentation Rate (cm/year)	Environment of Deposition
Big Lake	305	0 - 3,500	3,500	0.087	backswamp and natural levee, Little River
Big Lake	221	3,500 - 6,450	2,950	0.075	backswamp and natural levee, Little River
Big Lake	122	6,450 - 9,050	2,600	0.047	backswamp
Big Lake	648	0 - 9,050	9,050	0.072	backswamp and natural levee, Little River
Pemiscot Bayou	284	0 - 3,160	3,160	0.058	backswamp, natural levee, and channel-fill; Pemiscot Bayou)
Pemiscot Bayou	297	3,169 - 8,530	5,370	0.055	backswamp, natural levee, and crevasse splay, Miss. River)
Pemiscot Bayou	480	0 - 8,530	8,530	0.056	backswamp, natural levee, and crevasse splay, Miss. River; natural levee and channel-fill, Pemiscot Bayou

Table 10. Estimated ages of lithologic units and pollen zones in the Big Lake and Pemiscot Bayou Cores.

Unit	Interpreted Sedimentary Environment	Estimated Age (years B.P.)	Zone	Interpreted Vegetative Environment	Estimated Age (years B.P.)
	Big Lake Core				
1	Backswamp	0-1,400 years B.P.			
2	Backswamp	1,400-2,900 years B.P.	D	Bottomland arboreal	0-2,700
3	Natural Levee	2,900-5,400 years B.P.	C	Swamp and restricted bottomland arboreal	2,700-3,800
4	Backswamp	5,400-9,800 years B.P.	B	Drier bottomland arboreal and expanded upland arboreal	3,800-6,400
5	Natural Levee	9,800-9,900 years B.P.	A	Bottomland arboreal	6,400-9,900
	Pemiscot Bayou Core				
1	Channel-fill	0-1,100 years B.P.			
2	Natural Levee	1,100-1,600 years B.P.	D	Bottomland arboreal	0-2,400
3	Backswamp	1,600-2,400 years B.P.			
4	Backswamp	2,400-3,200 years B.P.	C	Swamp and restricted bottomland arboreal	2,400-4,700
5	Backswamp and Crevasse Splay	3,200-6,500 years	B	Drier bottomland arboreal and expanded upland arboreal	4,700-7,000
6	Natural Levee	6,500-8,100 years			
7	Natural Levee and Crevasse Splay	8,100-9,800	A	Bottomland arboreal	7,000-9,800

rates to be calculated and account for fluctuating rates; no evidence of erosion was identified in the Big Lake Core which penetrated backswamp and overbank sediment; the two radiocarbon dates from the Pemiscot Bayou Core, 23km northeast of the Big Lake Core, support the chronology of the Big Lake Core; and finally the estimated ages of the pollen zones correspond to ages of vegetation transitions in the surrounding region (King and Allen 1977). More data in the future will allow refinement of these estimates.

Additional radiocarbon dates on organic debris are available from the Zebree Site in the northern portion of the study area (Morse and Morse 1980) and in Big Lake (King 1980).

GEOMORPHIC AREAS

The study area in northern Mississippi County, Arkansas can be divided into two major geomorphic areas based on the genesis, nature, and the age of the sediment (Figure 23). The area to the west of Big Lake is a relict braided stream terrace of the Mississippi River. The sediment which underlies this terrace level is dominantly sandy and well to moderately well drained (Figure 24). This is the older of the two areas. Only a local thin veneer of sediment is contemporary with the sediments in Big Lake and to the east.

The area beneath and to the east of Big Lake is the meandering stream level of the modern Mississippi River and its tributary, the Right Hand Chute of the Little River (Figure 23). The sediment which underlies this level is dominantly silt and clay and is poorly drained. This is the younger of the two areas and continues to accumulate sediment during floods.

The two areas are separated by an escarpment which approximately parallels the western margin of Big Lake (Figure 23) (Saucier 1964). Accumulation of sediment by the meandering Mississippi and Little Rivers during the Holocene has nearly buried this escarpment. The present difference in elevation is a maximum of only 1-2m to the north and this diminishes to the south. In the past, the difference in elevation was in excess of 6.9m (the depth of the Big Lake Core which penetrated backswamp sediment at the base).

ENVIRONMENTS OF DEPOSITION

Relict Braided Stream Terrace

The braided stream terrace is composed of sediment deposited in four different environments, three of which are thick enough to map (Figures 23 and 24). The largest portion of the sediment which underlies the entire area is the ancient Mississippi River braided stream sediment. This sediment is locally buried by slackwater channel-fill in relict braided stream channels, natural levee or proximal overbank sediment of the Right Hand Chute of the Little River along the western margin of Big Lake, and thin backswamp sediment of the present meandering Mississippi River in the southern portion of the study area (not included in Figures 23 and 24).

Braided Stream. Braided stream sediment is a channel deposit of rapidly shifting and aggrading streams. The braided stream sediment of the ancestral Mississippi River occurs throughout the western portion of the study area as a terrace (Figure 23). The coarse to medium-grained sand deposited by braided streams occurs at the surface of most of this terrace. It is dominantly brown, grayish brown, or yellowish brown (10YR 5/2-6), coarse to medium-grained, bedded sand which is excessively well-drained. Relict braided channels preserved on this surface are broad (up to 600m along Buffalo Ditch) and shallow (0.8m along Buffalo Ditch at Bridge Area 2 and 1.7m in Manila 4 Core) (Figure 23). The orientation of the channels is NE-SW. The braided stream sediment is buried in the relict channels, along the edge of the escarpment, and to the south where the elevation is lower. The following cores, pits, or exposures penetrate this unit: Bridge Area 2 Cut, Country Club 1 and 2 Cores, Manila 1, 2, 3, and 4 Cores, and West Big Lake Core (Appendix D).

The braided stream sediment is the oldest surficial deposit in the study area, but its absolute age is unknown. The sediment surface is not covered by loess which was widely deposited in the Mississippi Valley during the late Pleistocene (Guccione et al. 1986) and thus is younger than the loess. The base of the Peoria Loess on Crowley's Ridge has been dated 25,700 ± 710 years B.P. by radiocarbon analysis and 19,200± 2,650 years B.P. (stratigraphically above the previous date) by thermoluminescence analysis. The youngest date from the Peoria Loess is 9,000 years B.P. by thermoluminescence analysis of loess near Vicksburg, Mississippi (Miller et al. 1984) but a more widely accepted date for the termination of loess deposition is 12,500 years B.P. (McKay 1979) in southwestern Illinois. Thus the age of the terrace is probably latest Quaternary and it is quite possible that this braided stream surface served as the source of the Peoria Loess in this region. If this is the case, the braided stream sediment was probably deposited between 25,700 and 12,500 B.P. The braided stream sediment is older than meandering stream deposits which cut across it at the escarpment. Thus, it is older than 9,050 years B.P., the age of the backswamp sediment at the base of the Big Lake Core.

Slackwater Stream. Slackwater stream sediments are channel-fill deposits found in channel segments that are no longer occupied by a permanent stream or are drowned channels. This drowning is the result of damming which may be tectonic (Fuller 1912) or alluvial (Saucier 1970) in origin.

The most recent braided stream channels are preserved on the relict braided stream terrace (Figure 23). These broad, shallow, and elongate depressions have subsequently been filled with very dark gray brown (10YR 3/1-3) poorly drained, poorly sorted, and relatively fine-grained stream sediment (Figure 24). This sediment was deposited by slackwater streams which occupied the abandoned channels. Currents increased during floods and rainy seasons, depositing the more sandy zones. Higher contents of silt and clay were deposited during low water when slower currents or nearly stagnant conditions occurred. This slackwater, reducing environment has incorporated and preserved organic matter. At the base of the deposit are rooted, upright tree stumps. In the upper portion of the deposit is transported and disseminated organic debris. The unit is exposed at the Bridge Area 2 Cut, Country Club 2 Core, and Manila 4 Core (Appendix D).

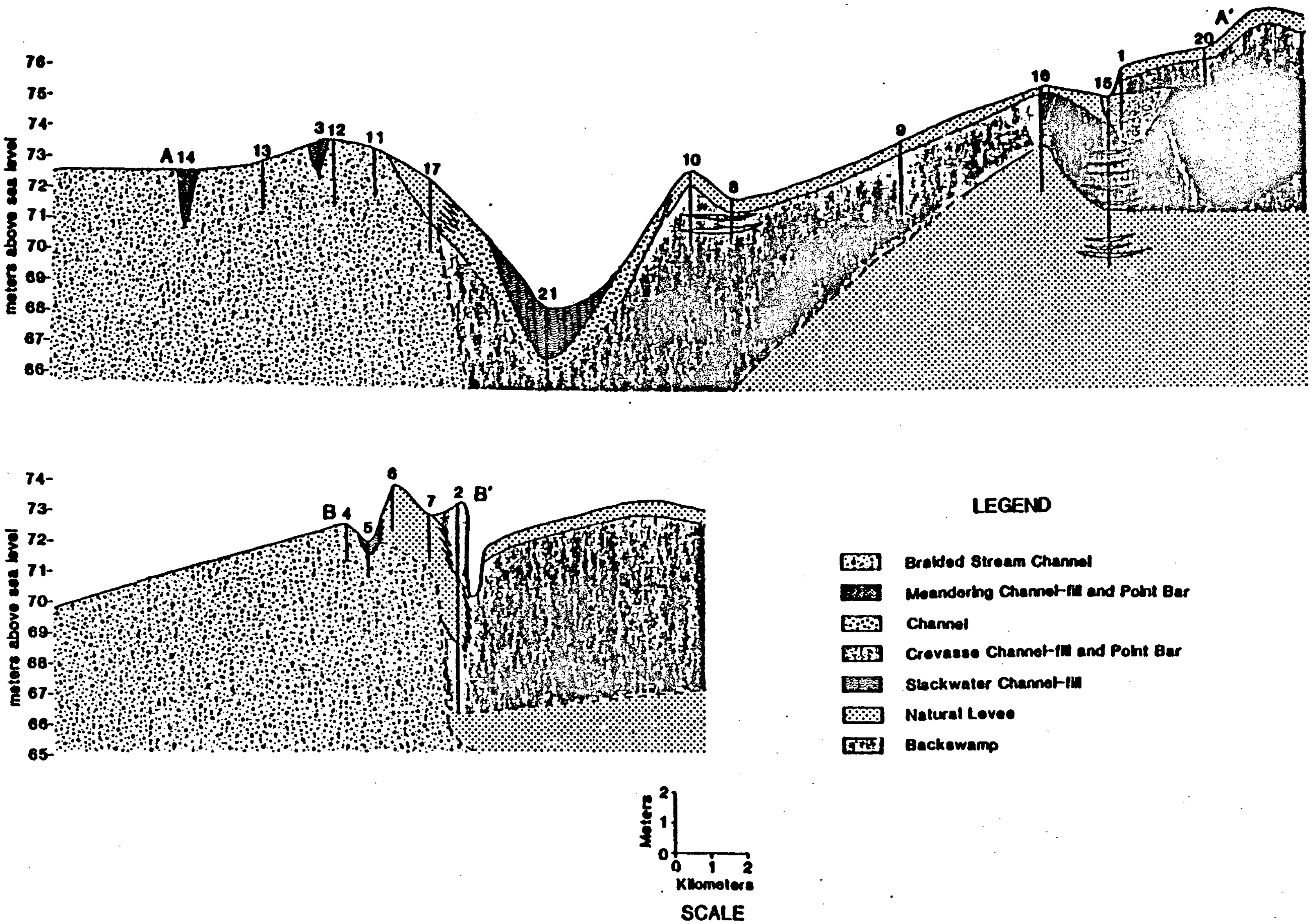
The age of the slackwater stream sediment is younger than the braided stream sediment which it overlies. No absolute date is available. Enough time elapsed between the deposition of the braided stream sand and the slackwater channel-fill sediment for trees to become established. A weak soil may have developed in the braided stream sand as suggested by the lack of bedding and an increase of 12% clay in the upper 17cm of the braided stream sediment compared to that of the underlying bed. This suggests that the slackwater sediment may be several thousand years younger than the braided stream sediment it overlies. The slackwater sediment is tentatively correlated with the Big Lake limnic sediment which has been dated as >180 years B.P. (I-9714) (King 1980). This correlation is based on similar lithology, thickness, and stratigraphic and geomorphic position of the two deposits.

<u>Natural Levee or Proximal Overbank</u>. Natural levee or proximal overbank sediments are deposited during flood events when stream water with its suspended load overflows its channel. The resulting deposit is relatively widespread and uniform. The coarsest and greatest quantity of sediment is deposited closest to the channel. The sediment fines and thins with distance from the channel and laterally grades into a backswamp deposit.

The natural levee or proximal overbank deposit of the Right Hand Chute of the Little River overlies braided stream sediment along the western margin of Big Lake (Figures 23 and 24). The fine-grained and very fine-grained sandy loam is commonly thin bedded to laminated sediment. It is dark brown to dark yellowish brown (10YR 3/4-4/4) where moderately well drained and has gray to brownish gray (10YR 6/1-5/2) mottles where somewhat poorly drained. Buried soils occur within the sediment and both the buried and surface soils are thin and generally have cambic horizons (Appendix D). This unit was deposited as a wedge-shaped sheet which is thickest near the Right Hand Chute of the Little River (east) and thins to the west. The sheet is narrow in the northern part of the study area near West Big Lake and Manila Cores (1.7 km) and become wider in the southern portion of the study area near the Country Club Cores (2.2km) (Figure 23). The following cores, pits, and exposures penetrate this unit: Country

Figure 24. Cross sections of Mississippi Valley alluvial sediments in northern Mississippi County, Arkansas. Numbers refer to the cores, pits, and outcrops used to construct the cross sections which are listed below and are described in Appendix D. Locations of the cross sections are shown on Figure 23.

1. Air Strip Core
2. Big Lake Core
3. Bridge Area 2 Cut
4. Country Club 1 Core
5. Country Club 2 Core
6. Country Club 3 Core
7. Country Club 4 Core
8. East Big Lake Core
9. Hay House Core
10. Just East of Big Lake Core
11. Manila 1 Core
12. Manila 2 Core
13. Manila 3 Core
14. Manila 4 Core
15. Pemiscot Bayou Core
16. State Line Cut
17. West Big Lake Core
18. West Big Lake Test Pit #1
19. Wood Core
20. Yarbro Core
21. Zebree - Big Lake Core



CROSS SECTIONS OF ALLUVIAL SEDIMENTS IN NORTHERN MISSISSIPPI COUNTY, ARKANSAS

Club 3 and 4 Cores, West Big Lake Core, West Big Lake Test Pit #1, and Wood Core (Appendix D).

The natural levee or proximal overbank deposit of the Right Hand Chute of the Little River has been indirectly dated by radiocarbon analysis at the Zebree Site (3MS20) in the northern portion of the study area. Twelve dates on the Late Woodland (Baytown period, Dunklin phase) and Early Mississippi period archeological debris within the plowzone of this natural levee range from 1,295 ± 74 to 1,157 ± 70 years B.P. (Late Woodland) and 1,176 ± 80 years to 910 ± 68 years B.P. (Early Mississippian). To the north of the Zebree Site, sites 3MS199 and 3MS471 have Early to Middle Woodland artifacts dating from approximately 2,000 to 1,2000 years B.P. to depths of 74 and 55cm respectively (Appendix B and Appendix D). Both sites have sterile zones below this depth.

One kilometer south of the Zebree site is site 3MS119. Early Mississippian artifacts dating approximately 1,200 to 1,000 years B.P. occur in a feature extending from the Ap horizon to 85cm in depth. This feature cuts through an Early to Middle Woodland midden at 29 to 49cm in depth. The midden is estimated to be approximately 2,000 years old.

Further to the south, sites 3MS21 and 3MS19 have the deepest and the oldest strata with archeological materials (Appendix B and Appendix D). Barnes and a small amount of Early Mississippian debris occur in the plowzone on 3MS21 from 0 to 25cm in depth below the pre-spoil land surface. These materials are estimated to be 1,500 years B.P. Early Woodland materials, including Poverty Point objects, occur below 50 and 35cm in depth respectively to the base of the pits at 107 and 102cm depths. These materials are estimated to be 2,000 to perhaps as much as 3,000 years old. The West Big Lake Core adjacent to site 3MS19 has 137cm of natural levee deposits. The lower 30cm of this unit was not excavated in the test pits because of the high water table and may also contain stratified archeological debris.

To summarize, radiocarbon dates and associations with archeological materials imply that the natural levee and proximal overbank deposition of the Right Hand Chute of the Little River began in this area at least 2,000 and perhaps more than 3,000 years ago and continued until 900-1,200 years B.P. (Figure 25). Middle to Late Mississippian and historic materials occur within the plowzone so that it is impossible to determine if the materials are stratified or if significant sedimentation ceased by approximately 900 years B.P. The highest sedimentation rate occurs in the northern part of the study area at 3MS199 and is estimated to be 0.041 cm/year during the last 1,800 years. At most other sites, the sedimentation rate during the last 2,500 years is estimated to be 0.023 to 0.028 cm/year. These rates are less than all the backswamp and fluvial sedimentation rates on the meandering steam level and are 1/3 to 1/2 of the sedimentation rates during the last 3,500 years at Big Lake.

Backswamp. Backswamp sediment is a slackwater deposit forming during flood events when muddy water is ponded between natural levees adjacent to the river channel and a valley wall, terrace escarpment, or some other higher topographic feature.

Backswamp sediment of the Mississippi River overlies the braided stream sediment just to the south of the study area. This massive clay is poorly drained and occurs in local areas. The unit was not penetrated in any cores on the relict braided stream terrace within the study area and therefore was not mapped, but it was observed in a few shallow pits just south of the study area. Further study of this unit is necessary.

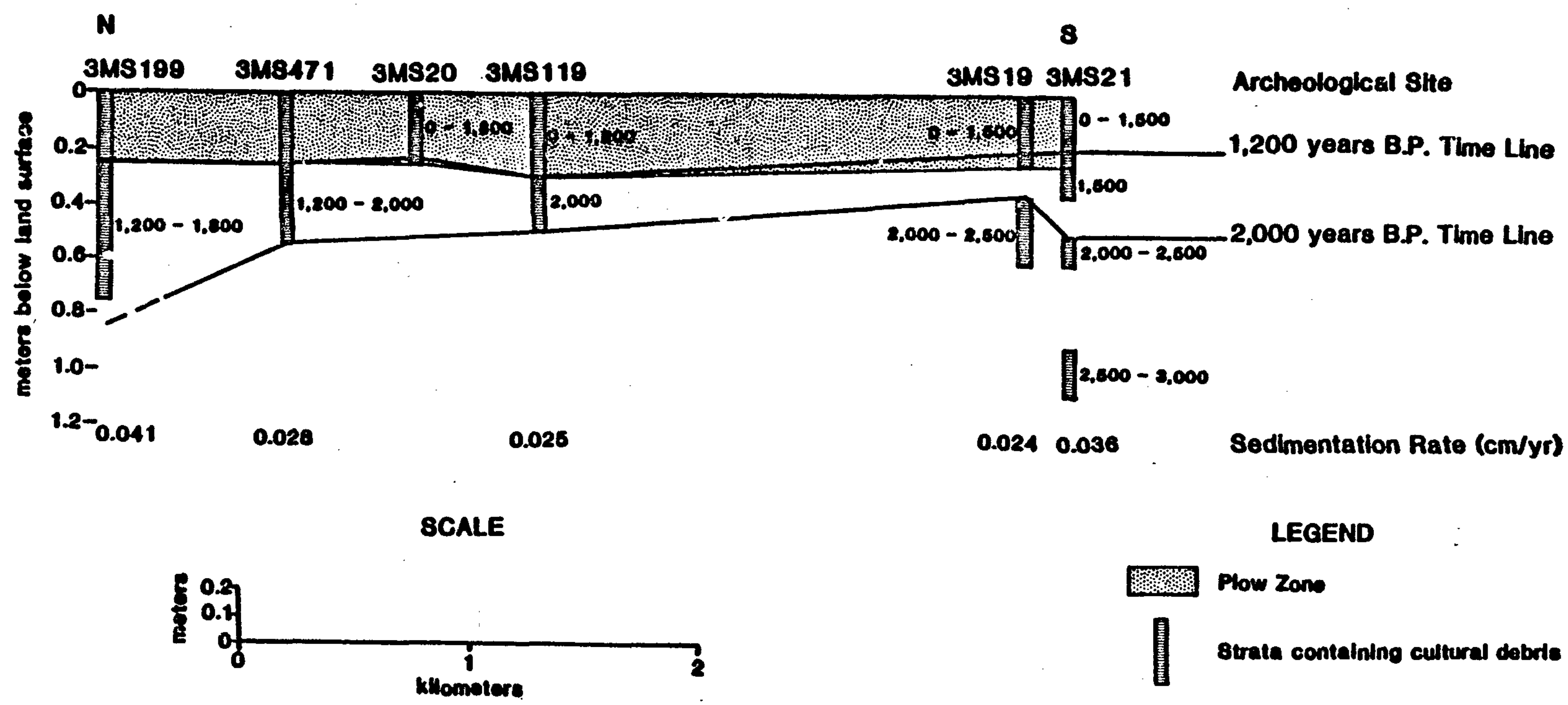
The age of the unit is unknown. A tentative correlation with the backswamp sediment at similar elevations on the meandering stream level to the east suggests that the unit in this area was deposited less than 3,500 years ago and is probably much younger.

Meandering Stream Level

The meandering stream level is composed of sediment deposited in six different environments from three different sources. The environments include channel, natural levee, channel-fill, point bar, crevasse, and backswamp, of which the latter four environments were present and thick enough to be mapped in the study area (Figure 23). Only the natural levee, crevasse, and backswamp environments were extensively sampled in this study and will be described in detail. The sources of sediment include the Mississippi River, the Right Hand Chute of the Little River, and Pemiscot Bayou. At the eastern margin of the study area is the modern meander belt of the Mississippi River and Pemiscot Bayou. Aerial photographs indicate abandoned channel-fill of the Mississippi River and crevasse channel and point bar deposits of Pemiscot Bayou occur in this area but the cores were not deep enough to adequately sample these materials. The central and largest portion of the area is dominantly composed of backswamp sediment derived from the Mississippi River. This backswamp sediment is interbedded with crevasse splay sediment and overlies buried natural levee sediment also derived from the Mississippi River to the east. Backswamp sediment derived from both the Mississippi River and the Little River occurs at the western margin of this level. This backswamp sediment is interbedded with channel and natural levee or proximal overbank deposits of the Right Hand Chute of the Little River. A thin veneer of a natural levee deposit derived from both the Mississippi River and the Right Hand Chute of the Little River buried the channel-fill, point bar, and backswamp sediment over nearly the entire meandering stream level. A thin veneer of a natural levee deposit derived from Pemiscot Bayou locally buries the channel-fill, point bar, and backswamp sediment adjacent to its channel.

Backswamp. Backswamp sediment occurs throughout the eastern portion of the study area (Figures 23 and 24). It is composed of massive clay or silty clay, commonly with sand percentages of

Figure 25. Sedimentation rates are calculated for natural levee or proximal overbank deposits of the Right Hand Chute of the Little River using radiocarbon ages (years B.P.) (3MS20) or estimated age (yeas B.P.) of cultural debris within the plowzone and stratified cultural debris below the plowzone. The ages (years B.P) are adjacent to the symbol for strata containing cultural debris at each site.


N
S
3MS199
3MS471
3MS20
3MS119
3MS19
3MS21
Archeological Site
1,200 years B.P. Time Line
2,000 years B.P. Time Line
meters below land surface
0
0.2
0.4
0.6
0.8
1.0
1.2
1,200 - 1,800
1,200 - 2,000
0 - 1,800
0 - 1,800
2,000
0 - 1,500
2,000 - 2,500
0 - 1,500
1,500
2,000 - 2,500
2,500 - 3,000
0.041
0.028
0.025
0.024
0.036
Sedimentation Rate (cm/yr)
SCALE
meters
0.2
0.1
0
0
1
2
kilometers
LEGEND
Plow Zone
Strata containing cultural debris

less than 10. The silt content increases and becomes slightly coarser in the upper part of the unit (Appendix D). Laterally, the unit coarsens with increasing silt percentages adjacent to the meander belt of the Mississippi River and Pemiscot Bayou in the east and adjacent to the Right Hand Chute of the Little River in the Big Lake area in the west. Conversely, the clay content is greater in the lower part of the unit and in the central portion of the study area. Backswamp sediment is very poorly drained because the topography is nearly flat, and the texture of the material is very fine-grained. The color is usually dark gray to grayish brown (10YR 4/1-5/2) with a few yellowish brown mottles (10YR 5/6-4/6).

The backswamp sediment is a wedge-shaped deposit which is thickest in the western portion of the study area at Big Lake and thins to the east (Figure 24). At Big Lake more than 4.7m of clay and silty clay are interbedded with 2.1m of the Right Hand Chute of the Little River natural levee or proximal overbank sediment. The unit thins to the east, toward the locus of Mississippi River meander belt sedimentation. At Pemiscot Bayou, less than half the backswamp sediment thickness at Big Lake is present (2.3m). At the channel of the Mississippi River (Yarbro Core) and only 0.4m of clay overlies upper point bar or natural levee sediment of Pemiscot Bayou (Air Strip Core). Backswamp sediment is present in the Air Strip Core, Big Lake Core, East of Big Lake Core, Hay House Core, Just East of Big Lake Core, Pemiscot Bayou Core, State Line Cut, and Yarbro Core (Appendix D).

Within the backswamp sediment, there are weak buried soils with thin B horizons or A/C horizons (Appendix D), but it is unknown if they are the same age at both locations. The estimated age of lithologic units suggests that they are not (Table 10). More cores and dating should be available before any soil stratigraphic correlations can be made.

A soil in the upper portion of the backswamp unit indicates that the sedimentation rate slowed or ceased long enough for soil horizon development before it was buried by the natural levee deposit derived from the Mississippi River. This soil or organic accumulation is present at all sites where the backswamp sediment occurs, except at Pemiscot Bayou. In this core backswamp sediment grades up to natural levee sediment derived from Pemiscot Bayou and there is an erosional contact with the overlying channel deposit of the bayou. Therefore, the soil may have been present but was subsequently removed.

Backswamp sedimentation has continued throughout the Holocene. Sedimentation began more than 9,050 ± 150 years B.P. in the Big Lake area (Table 10). The base of the backswamp sediment is estimated to be more than 9,900 years old because the core did not completely penetrate the backswamp sediment, and therefore, the initial date of sedimentation must be older. Sedimentation has continued to the present time at this site.

The initial average sedimentation rate is 0.047 cm/year. This rate nearly doubled to 0.087 cm/year during the last 3,500 years (Table 9).

To the east at Pemiscot Bayou, backswamp sedimentation is estimated to have occurred between 6,500 and 1,600 years B.P. (Table 10). Initial sedimentation of the backswamp sediment is younger than that at Big Lake and final sedimentation of backswamp sediment is older than that of Big Lake. Unlike the Big Lake Core, the average sedimentation rate of the Pemiscot Bayou Core has remained nearly constant. The average sedimentation rate is 0.056 cm/year, intermediate between the high and low sedimentation rates of the Big Lake Core (Table 9).

Natural Levee. Natural levee sediment covers most of the meandering stream level and is also interbedded with backswamp sediment in the subsurface (Figure 24). The source of the natural levee sediment and the distance from the source determines the nature of the sediment. All natural levee sediment is sandy. The percentage of total sand and the sorting of the material is dependent on the proximity to the source. Adjacent to the source, the percentage of sand ranges from approximately 60-80, clay content is approximately 10%, and the sediment has a unimodal size distribution (Air Strip Core, West Big Lake Test Pit #1, and Yarbro Core). At a greater distance from the source, the percentage of sand is only 20-60, clay is approximately 20-55%, and the sediment is bi- or trimodal (Big Lake Core, East of Big Lake Core, Pemiscot Bayou Core, and State Line Cut). The size of the sand fraction present is dependent on the competence and the size of the stream from which the sediment was derived. Sand in natural levee deposits derived from the Mississippi River has a medium sand-size mode many kilometers from the channel. In contrast, sand in natural levee deposits derived from Pemiscot Bayou and Little River, much smaller streams than the Mississippi River, have a fine to very fine sand-size mode at a distance from the channel but may have a medium sand-sized mode adjacent to the channel.

The drainage and color of a natural levee deposit is dependent on the texture. Most of the surface natural levee sediment is dark gray to very dark grayish brown (10YR 4/1-3/2) but some coarser-textured beds are light yellowish brown (10YR 6/4). In the subsurface where the natural levee sediment is interbedded with backswamp sediment, it is gray to dark grayish brown (10YR 6/1-4/2).

A natural levee is generally a wedge-shaped deposit, but in the study area a multitude of sources for the modern natural levee results in a more blanket-shaped deposit, approximately 35-45cm thick (Figure 23). Natural levee sediment derived from the Mississippi River is present in the central part of the meandering stream level. A surface deposit is present at the Hay House Core and State Line Cut, and a buried deposit is present in the Pemiscot Bayou Core and State Line Cut (Appendix D). Natural levee sediment derived from Pemiscot Bayou is present in the eastern portion of the study area adjacent to the bayou. This surface deposit occurs in the Air Strip Core, the Pemiscot Bayou Core, and the Yarbro Core (Appendix D). Natural levee or proximal overbank sediment derived from the Right Hand Chute of the Little River is present in the western portion of the meandering stream level and in the eastern portion of the relict braided stream terrace (discussed in a previous section). A surface deposit occurs in Country Club 3 and 4 Cores, East of Big Lake Core, Just East of Big Lake Core, West Big Lake Test Pit #1, and the Wood Core (Appendix D). A buried natural levee or proximal overbank deposit derived from the Right Hand Chute of the Little River is present in the Big Lake Core (Appendix D). More detailed mapping of the surface natural levee is necessary to trace distribution and thickness of sediments from each source. The shape and the distribution of buried natural levee deposits is not known because of an inadequate number of deep cores.

Buried natural levee deposits have been dated by radiocarbon analysis. The oldest easily identified natural levee sediment, estimated to have been deposited between 9,800 and 6,500 years B.P., is the buried Mississippi River-derived levee sediment in Pemiscot Bayou (Table 10). The uppermost portion of a natural levee, estimated to be 9,800 to 9,900 years old may also occur at the very base of the Big Lake Core. Therefore, the age of the upper part of this unit is time transgressive and becomes younger to the east. A buried Right Hand Chute of the Little River-derived natural levee or proximal overbank sedimment, estimated to have been deposited between 5,400 and 2,900 years B.P., occurs at Big Lake (Table 10).

Young natural levee sediment is present at the surface over much of the meandering stream level (Figure 24). The surface natural levee sediment derived from the Mississippi River is probably the same age as the upper portion of the backswamp sediment in the western portion of the study area and younger than 1,600 years B.P., the estimated age of the youngest backswamp sediment in Pemiscot Bayou Core (Table 10). This medium sand-size natural levee sediment derived directly from the Mississippi River is older than the fine sand-size natural levee sediment derived from Pemiscot Bayou in the eastern portion of the study area, because Pemiscot Bayou (a crevasse channel of the Mississippi River) has eroded the natural levee derived directly from the Mississippi River. Pemiscot Bayou levee is the youngest levee on the meandering stream level in the study area and is estimated to be younger than 1,600 years.

<u>Crevasse Splay or Channel</u>. Crevasse sediment is deposited during flood events when stream water with its suspended load and its bed load breaches the natural levee. It may spread in a fan shape beyond the levee as a splay or be confined to a channel. These localized deposits fine upward and away from their source and are most common along concave banks of the source channel. Sediment interpreted to be a crevasse deposit occurs in the central and western portions of the meandering stream level (Figures 23 and 24). The crevasse splay or channel sediment is

presumed to occur adjacent to ancient channels of the Mississippi River. It is bedded sediment that is coarse -grained and commonly thicker-bedded than natural levee deposits. The percentage of sand is generally greater than 80 and the clay content is 10% or less, resulting in a deposit with a dominant sand-size mode and a small secondary clay-size mode. These crevasse splay or channel strata are interbedded with much finer-grained backswamp or natural levee deposits resulting in a large textural contrast and abrupt contacts between beds. These beds near Pemiscot Bayou are up to 27cm thick. The color is pale brown to grayish brown (10YR 6/3-5/2).

Crevasse splay deposits are generally small and fan-shaped with the thickest accumulation at the apex adjacent to the channel, whereas crevasse channel deposits are elongate and have the same shape and environments as a stream. Because many of the crevasse deposits in the study area occur in the subsurface and only widely spaced cores were available, the geometry of the units could not be determined in this study. Crevasse deposits derived from the Mississippi River are present in the Pemiscot Bayou Core (Figure 24). Two episodes of crevasse channel deposition occur in the Pemiscot Bayou Core. The older crevasse sediment is estimated to have been deposited between 9,800 and 8,100 years B.P. The younger crevasse sediment is estimated to have been deposited between 6,500 and 3,200 years B.P. (Table 10).

Channel, Channel-fill, and Point Bar Sediments. Channel, channel-fill, and point bar deposits are dominant in the eastern margin of the study area, based on aerial photograph interpretation (Figure 23). However, at several of the coring sites these relatively old features are being buried by a veneer of natural levee and backswamp sediment (Figure 24). The shallow Air Strip and Yarbro cores (2.0-2.3m deep) did not penetrate the channel, channel-fill, or point bar deposits. The Pemiscot Bayou Core is located along the convex margin of the Pemiscot channel. Here the upper 82cm of sediment is interpreted to be a channel-fill from the margin of the channel and is therefore much thinner than the total channel-fill thickness. It is a poorly sorted, medium sand-size, grayish brown (10YR 5/2-4/2) sediment that is weakly laminated and has a sharp contact with the underlying natural levee deposit. This channel-fill sediment is estimated to have been deposited during the last 1,100 years (Table 10). This duration of channel-filling and channel stability seems long. The channel position of Pemiscot Bayou has remained essentially stable since 1846-1848 and perhaps it has been stable for approximately 1,000 years. Alternative interpretations might include a natural levee deposit rather than channel-fill in the upper 82cm of the Pemiscot Bayou Core or a more rapid sedimentation rate in the upper portion of the core.

The proximal overbank deposits of the Right Hand Chute of the Little River are up to 11cm thick. Channel deposits of the Right Hand Chute of the Little River are present near Big Lake at the East Big Lake Core and Just East of the Big Lake Core. The presence of the Right Hand Chute of the Little River channel from

1846-1848 at the same location as the East of Big Lake Core (Saucier 1964) suggests that these channel sediments may have been deposited at that time.

GEOLOGIC AND VEGETATIVE HISTORY

The study area in Mississippi County, Arkansas includes two major geomorphic surfaces composed of sediment of different ages and environments of deposition (Figures 2 and 3). The oldest sediment in the area is the braided stream sand deposited by the ancestral Mississippi River during the late Pleistocene. No absolute dates are available for this sediment but the upper portion of the sand was probably deposited less than 12,500 and more than 9,050 years B.P. (estimated to be more than 9,900 years B.P.). This deposit is preserved west of Big Lake and presumably also extends west of tha study area. The sand probably extended east of Big Lake to the eastern valley wall of the Mississippi Valley. The entire deposit formed a broad alluvial surface during the late Pleistocene with wide, shallow, braided channels cut into it.

A drastic change in the stream regime occurred between 9,050 and 12,500 years B.P. The Mississippi River degraded its channel at least 7m over a lateral distance of approximately 48km and established a new lower alluvial surface. The river also changed from a braided channel pattern with a dominant bed load to a meandering channel pattern with a mixed bed load and suspended load. By 9,050 years B.P. the Mississippi River had begun to aggrade and fill its new valley. During most of its aggradation the channel has been restricted to the east side of the valley and did not deposit any channel or point bar deposits in the area of the Pemiscot Bayou Core or the Big Lake Core in the west side of the valley. The Mississippi River channel was probably near the center of the floodplain but slightly east of Pemiscot Bayou Core between 9,800 and 6,500 years B.P. During this time natural levee sediment and crevasse splay sand beds were deposited at Pemiscot Bayou. The oldest portion of this natural levee deposit may have extended across the entire flood plain because some sandy levee sediment, estimated to be 9,900 years old is also present along the western margin of the flood plain at the base of the Big Lake Core. Throughout the remainder of this interval the western margin of the flood plain was distant from the locus of channel deposition and backswamp sedimentation occurred.

The Mississippi River channel migrated to the eastern side of its valley between 6,500 and 1,600 years B.P. and the Right Hand Chute of the Little River developed to drain the western margin of the flood plain. During this time the Mississippi channel was distant from the Pemiscot Bayou Core site and backswamp sediment accumulated there. Further to the west at Big Lake Core site the Right Hand Chute of the Little River was depositing sandy natural levee or proximal overbank sediment, which is interbedded with backswamp sediment. The levee or overbank sediment accumulated at the Big Lake Core site between 5,400 and 2,900 years B.P. The stream apparently shifted to the west and deposited natural levee or proximal overbank sediment on the western m... of the Big Lake, approximately between 2,000 to 3,000 and ... years B.P.

During the past several thousand years sandy natural levee, crevasse channel, point bar, and channel sediment has become very widespread and extends over most of the meandering stream level. In the central portion of the meandering stream level natural levee sediment derived from the Mississippi River is the most recent sediment. It was probably deposited prior to 1,600 years B.P. This suggests that the abandoned Mississippi River channels just east of the Pemiscot Bayou site are also at least as old and may have been the source of the levee sediment. Since that time the Mississippi River channel has migrated to the east and Pemiscot Bayou, a crevasse channel, has developed in the central portion of the flood plain. Channel-fill and natural levee sediment of Pemiscot Bayou are estimated to be less than 1,600 years old. In the western portion of the meandering stream level, natural levee or proximal overbank and channel sediment derived from the Right Hand Chute of the Little River are the most recent sediment. They are a continuation of the earlier natural levee or overbank sedimention in this area. The natural levee and channel sediment along the eastern margin of Big Lake have not been dated but are probably less than 1,000 years old and may be only several hundred years old. The 1846-1848 channel of the Right Hand Chute of the Little River was 1.3km east of the present Big Lake. Since 1846, the Right Hand Chute of the Little River has occupied many channel positions west of the 1846 position and across the whole area now occupied by Big Lake. Organic limnic sediment has been dated (180 years B.P. (King 1980) and overlies channel sand. Similar sediment, which is thought to be the same age, fills the abandoned channels to the west of Big Lake on the braided stream surface.

The vegetation history does not correlate directly with the depositional history of the meandering stream level. The four pollen zones recognized in this study (Chapter 7) do not correspond to sedimentary environments (Figure 26 and Table 10). Zone A is a bottomland arboreal habitat which existed from nearly 10,000 to 6,400 or 7,000 years B.P. (Table 10). A backswamp environment existed at Big Lake during this interval. Similar species are present at Pemiscot Bayou but here the environment of deposition is natural levee interbedded with crevasse beds. Herbaceous pollen is more abundant at Pemiscot Bayou than at Big Lake and the ponded or moving water habitats indicated by the herbaceous pollen may have developed in crevasse channels or a nearby Mississippi River channel.

Pollen zone B is a bottomland arboreal and expanded upland forested habitat with very limited swampy conditions which existed from 6,400 or 7,000 to 3,800 or 4,700 years B.P. (Table 10 and Figure 26). This climate, drier than that during the early Holocene, does not seem to be reflected in the sedimentary record. Natural levee sediment was being deposited at Big Lake while backswamp clay and interbedded crevasse sand was deposited at Pemiscot Bayou.

Pollen zone C is a wet swampy habitat with restricted areas of bottomland arboreal habitat which existed between 3,800 or 4,700 and 2,700 or 2,400 years B.P. (Table 10 and Figure 26). This moist condition is also not reflected in the sedimentary record. Natural levee or proximal overbank sediment continued to be deposited at Big Lake. Backswamp sedimentation without any interbedded natural levee or crevasse deposits at Pemiscot Bayou suggests that channels of the Mississippi River and any crevasse channels were at some distance from this site.

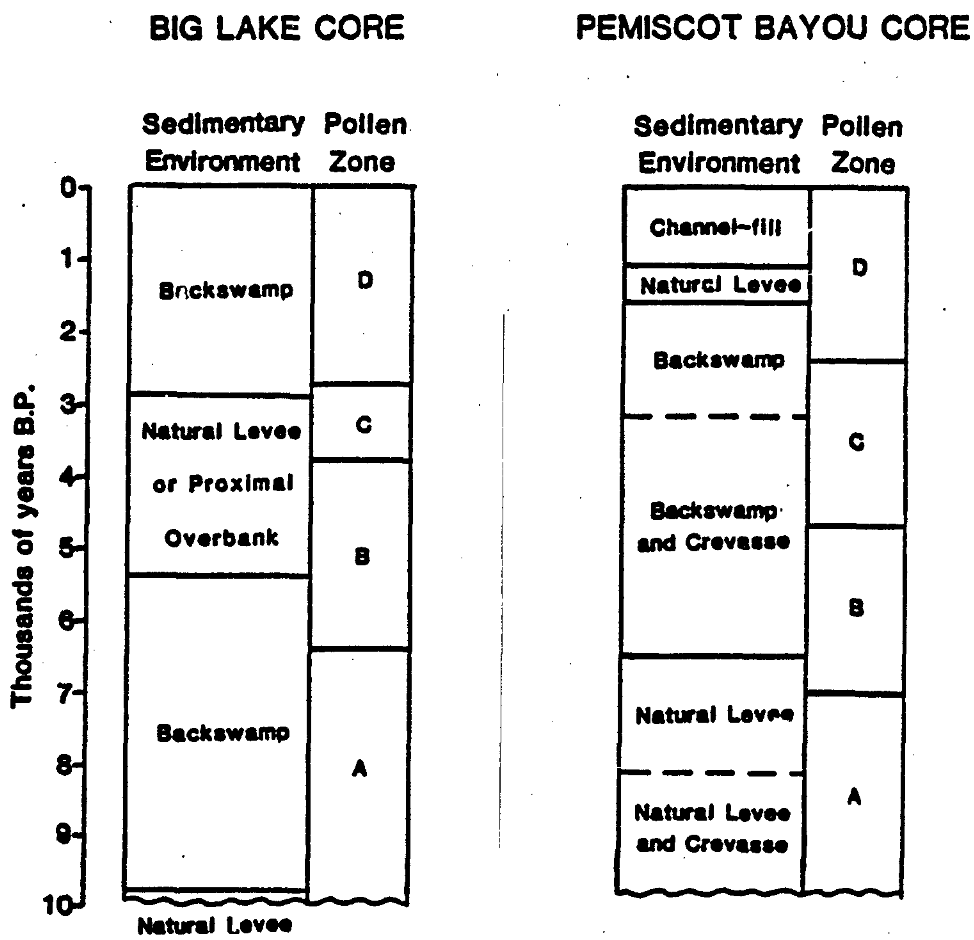
Pollen zone D is a bottomland arboreal habitat which existed from 2,400 or 2,700 years B.P. (Table 10 and Figure 26) to present. This habitat, drier than the previous 1,500 to 2,000 years, is not reflected in the sedimentation record. A backswamp environment existed at Big Lake but natural levee and channel-fill of Pemiscot Bayou was deposited at the Pemiscot Bayou site.

EARTHQUAKE PHENOMENA

Mississippi County, Arkansas is in the impact area of the New Madrid Earthquake, 1811-1812. It is likely that previous earthquakes have also impacted the area (Russ 1982; Lafferty et al. 1984). Two major types of earthquake phenomena have been reported in the study area, sand blows and sunk lands. Sand blows formed when water-saturated sediment at 2-15m depths was liquified during the earthquake. Gas, liquid, and solid debris were extruded from depth through fissures and vents in the overlying cohesive silt and clay. It is the solid material, which in the study area is dominantly coarse to fine-grained sand with some clay and organic matter, that is preserved today as circular or linear sand blows. The second phenomena is the subsidence of land, known as sunk lands.

Historic reports and scientific study of the area have substantiated the formation of numerous sand blows during the 1811-1812 earthquake (Fuller 1912; Penick 1976). The original height of the sandblows is commonly 15cm and the thickness of the sand is 50 to 10cm. The contact of the sand with the underlying dark silty clay is sharp where it is deeper than the plowzone. Fuller (1912) and Saucier (personal communication 1986) report that conduits extend through the fine-grained sediment and connect the source of the sand at depth with the extruded material at the surface. No cross sections of sand blows were observed in this study but the fissures are assumed to occur and locally may extend at least 7m through the thickness of the backswamp silt and clay. Circular sand blows are commonly 3 to 5m but may be 35m or more in diameter (Fuller 1912). Linear sand blows may be 15m to 6km long and do not have any consistent lateral grain-size distribution (Miss Sand, Appendix D). Both circular and linear blows are oriented along a NNE-SSW or N-S trend. They occur in the western portion of the meandering

Figure 26. Chronology of the sedimentary and vegetative environments of Holocene deposits in the Big Lake Core and the Pemiscot Bayou Core. Estimated ages of lithologic and pollen boundaries are included in Table 5. Brief descriptions of pollen zones are included in Table 10 and a complete discussion is in Chapter 7. Location of cores is shown on Figure 23.


BIG LAKE CORE
PEMISCOT BAYOU CORE
Sedimentary Environment
Pollen Zone
Thousands of years B.P.
0
1
2
3
4
5
6
7
8
9
10
Backswamp
Natural Levee or Proximal Overbank
Backswamp
Natural Levee
D
C
B
A
Sedimentary Environment
Pollen Zone
Channel-fill
Natural Levee
Backswamp
Backswamp and Crevasse
Natural Levee
Natural Levee and Crevasse
D
C
B
A

stream level between Big Lake and the meander belts of the Mississippi River and Pemiscot Bayou (Left Hand Chute of the Little River).

Historic reports and scientific study of the sunk lands have not reached a consensus on the relationship of the sunk lands to the earthquake. In the study area Big Lake has been reported as a sunk land formed by an uplift occurring across old drainage systems (Fuller 1912:72). However, prior to the 1811-1812 earthquake many swamps did exist in the area and it was already known as the "sunk country" (Penick 1976: 88-97). Saucier (1970) suggested that these sunk-land features, including Big Lake in the study area, are the result of alluvial drowning of relict braided stream channels by the Left Hand Chute of the Little River (Pemiscot Bayou). The latter is a major crevasse channel of the Mississippi River which aggraded its channel and natural levee. This levee acted as a dam for the relict channels that it cut across, including the Right Hand Chute of the Little River which forms Big Lake. Saucier estimated that the Left Hand Chute of the Little River formed between about 1,000 and 1,500 years ago and was inactive and abandoned long before the 1811-1812 earthquake. By inference, he suggests that the age of the alluvial channels and development of the sunk lands is also in that same time span. King (1980) cored sediments in Big Lake and the basal organic debris (155-160cm depth) that he sampled was dated as <180 years B.P. (I-9714). It overlies sandy clay or sand with no apparent organic content. King concludes that the basal sandy clay or sand is non-lacustrine, that the organic debris represents the formation of the lake, and that the age of the lacustrine sediment suggest that the New Madrid Earthquake may be a possible cause. In contrast, Saucier (written communication, 1987) has suggested that "the basal sand may be due to the widespread liquification (sand blows) during 1811-12. Thus the date may be valid, but older limnic sediments could also be present."

This study can suggest several hypotheses. The Right Hand Chute of the Little River is not a relict braided stream channel but is probably a channel developed to drain the backswamp and is interbedded with backswamp sediment as the meandering level of the Mississippi River floodplain aggraded. The Right Hand Chute of the Little River developed at least 5,400 years ago depositing channel and natural levee or proximal overbank sediments. It is the natural levee or proximal overbank sediment on the west edge of Big Lake that served as a substrate for Indian occupation sites 2,000 or 3,000 to 1,000 years B.P. and the river which served as a food, water, and materials source for the inhabitants. The Left Hand Chute of the Little River developed as a crevasse channel of the Mississippi River approximately 1,600 years B.P. It deposited channel and natural levee sediment but there is no evidence that this aggradation caused alluvial drowning prior to several hundred years ago. The stratigraphy and dates of the cores within Big Lake (King 1980) and at the margins of Big Lake (Big Lake Core, Country Club 3 and 4 Cores, East of Big Lake Core, Just East of Big Lake Core, and West of

Big Lake Core, and West of Big Lake Test Pit #1, Appendix D) all support the presence of an alluvial channel until <180 years ago. Because the development of the lake occurred considerably later than the development of the Left Hand Chute of the Little River and approximately at the same time as the New Madrid Earthquake, the earthquake is the suspected cause. It is possible that the earthquake uplifted the land to the southeast of the sunk lands causing alluvial drowning of both modern drainage channels (Right Hand Chute of the Little River) and relict braided channels (Buffalo Channel and the St. Francis River).

IMPLICATIONS FOR ARCHEOLOGY

The sedimentologic and geomorphic history of the region can be useful for surface and buried archeological site prediction, interpretation of the physical environment, and a prediction of the resources available. This study of northern Mississippi County is a good example. The study area has been divided into two major geomorphic divisions of two different ages, the relict braided stream terrace and the meandering stream level. The surface of the relict braided stream terrace in the western portion of the study area is dominantly composed of braided-stream sand which was deposited prior to human occupation. In most areas on this surface archeological sites would be at or very near the surface and are unlikely to be stratified.

Three other subdivisions of the braided stream level, the slackwater braided channel-fill, the natural levee or proximal overbank, and the backswamp may contain shallow buried prehistoric archeological sites. The slackwater fill in relict braided stream channels (Buffalo Ditch) may have buried sites approximately one meter or less. If the correlation of the braided channel-fill with the Big Lake lacustrine sediment is correct, these sites would be at the contact of the braided stream sand with the overlying clay loam channel-fill. There will not be prehistoric materials stratified within the clay loam because it is less than 180 years old. In the study area, no sites or artifacts have been found within this geomorphic subdivision to date. However, sites and artifacts have been found in the same geomorphic setting immediately south of the study area (Spears et al. draft in progress).

The natural levee or proximal overbank geomorphic subdivision may contain stratified sites to a depth of greater than 2 meters along the western margin of Big Lake. The sites could be stratified through the entire thickness of the deposit. The Right Hand Chute of the Little River, the source of the natural levee or proximal overbank sediment developed as a channel by at least 5,400 years B.P. Natural levee or proximal overbank sediment accumulated until at least 1,000 years B.P. Abundant late Holocene prehistoric sites have been found in this geomorphic subdivision. These ideal sites were relatively well drained areas adjacent to an abundant food, water, and materials source, and a transportation pathway. The estimated age of the sites

(2,000 or 3,000 to 1,000 years B.P.) and of pollen zone D in both the Big Lake and Pemiscot Bayou Cores (2,400 or 2,700 years B.P. to present) indicate that occupation of the area occurred during relatively dry conditions when arboreal habitats dominated.

The backswamp geomorphic subdivision may also contain stratified sites in the thin backswamp sediments. This subdivision is just south of the study area and was not examined in detail in this report. Spears et al. (draft in progress) is examining this area and reports that sites do exist.

The second major geomorphic area, the meandering stream level, has formed during human occupation in the region. All the sediments have been deposited during the Holocene and have the potential to include artifacts. Areas that would be most likely to contain sites are the natural levees of the Right Hand Chute of the Little River on the east side or within the Big Lake, the Left Hand Chute of the Little River (Pemiscot Bayou), and the Mississippi River. Natural levees are favored sites for occupation because of the better drainage than the adjacent backswamp, less likelihood of prolonged flooding, and an adjacent food, water, and materials source. The backswamp is not a favored environment for sites because of the relatively poor drainage and frequent flooding. Point bars of the various rivers may have some potential for site location, especially temporary sites, because of the relatively good drainage and the adjacent food, water, and materials source. However, frequent flooding may discourage the use of this environment for permanent occupation sites. No prehistoric archeological sites have been found in any of these environments on the meandering stream level in the study area. Buried sites at the eastern margin and to the east of the study area may occur adjacent to Pemiscot Bayou (the Left Hand Chute of the Little River) and channels of the Mississippi River.

CHAPTER 6

PREDICTIVE MODEL AND THE DISTRIBUTION OF ARCHEOLOGICAL SITES

by

Robert H. Lafferty III

PREDICTIVE MODELS IN ARCHEOLOGY

The use of predictive models and many of the underlying assumptions are rooted in settlement analysis dating back to Willey's classic study in the Viru Valley, Peru (Willey 1953). In that study, Willey traced the changes in settlement types and locations through several thousand years of prehistory. In a sense, this was the beginning of predictive models because certain properties of types of sites were identified. However, in actuality these properties were statements of empirical observation.

Since that pioneering work, settlement analysis has become an integral part of archeology (Chang 1958; Kurjack 1974; Harn 1971; Munson 1971; Adams 1965), and in more recent times has included analyses of the settlement systems often in conjunction with ecological systems (Muller 1978, Kurjack 1974; Peebles 1971; Smith 1978; Ward 1965; Winters 1969; Lewis 1974). These studies mark the beginning of establishing systematic relationships between archeological sites and particular environmental features such as levee soils, ecotones, and rivers.

In the 1970s, as a part of the "New Archeology" movement, attention has been paid to the factors that cause the perceived structures in the settlement systems (Gumerman 1971). Most of these analyses have involved making the Mini-Max assumption - people live where they can get maximum returns for minimum input - derived from Zipf's (1949) principle of least effort. This and other methods and approaches were borrowed from geographers who had developed and continue to work with important methods of locational analysis (Chisolm 1970; Dacey 1966; Morrill 1962, 1968; Vining 1955) and explanatory theories (Bylund 1960; Christaller 1966, original 1933) for over a half century.

Locational analysis has been of critical importance in the formation of many of the concepts used in this study. There have been several applications of the locational properties derived from geography used in archeological analysis (Crumley 1976; Lafferty 1977; Marcus 1973; Steponaitis 1978) and site catchment analysis (Lafferty and Solis 1979; Peebles 1978; Roper 1974, 1975, 1979; P. Morse 1981). These studies, both successes and failures, have lead to a refinement of the methods and underlying theory.

Along with a growing awareness that archeological sites are situated in particular kinds of environments came the plotting of densities of archeological sites by ecozones in settlement pattern research (Gumerman 1971; Plog 1974) and in Cultural Resources Management studies (Mueller 1974; Schiffer and House 1975). The realization that these densities varied in different ecozones led to the premise that if settlement models could be developed by surveying only a sample of a project area, then on large land-modifying projects such as reservoirs and strip mines a great deal of time, money and human energy could be saved. Several projects used this approach (Klinger 1976) but were generally found to be unsuccessful. The best applications occur, except for more restricted kinds of projects, where one simply had to identify environments where sites do not occur (C. Price 1979), and recommended placement of the powerline or pipeline accordingly. The major problems with this approach were that the methods did not allow for the specificity that was required and, in general, the approach was too simplistic.

The current generation of models was developed from a synthesis of previous work (Lafferty 1977; Lafferty and Solis 1979; Limp 1978, 1981) to construct practical models used to predict site locations over large surfaces for cultural resources management purposes (Lafferty et al. 1981, 1984, 1985a; Lafferty and House 1986; Hay et al. 1982). This approach makes assumptions of Rational Choice optimization theory (Arrow 1951, Limp, Lafferty and Scholtz 1981). These assumptions involve a more complex interrelationship of variation than was possible with the less sophisticated Mini-Max assumption (Limp 1980), and includes the recognition that different classes of human settlement are dependent on different kinds of variables (Lafferty 1977). Also there is the increasing sophistication of the statistics being employed which more closely approximate the reality of a complex environment.

Regression analysis was seen as a means of modeling the complex environments and their relation to archeological sites. These attempts also had several problems. The first problem was the use of the archeological site as the unit of analysis (Lafferty and Solis 1979). This was the normal procedure in settlement analysis, but it left the investigator not knowing what the characteristics were of the locations without sites. How many locations had the same environmental characteristics as those where site would be located which did not have archeological sites? This and other questions have important implications for how full the landscape was and other questions of theoretical importance. From a management point of view these models failed because they could not be applied to the unsurveyed portions of the project area (Lafferty and Solis 1979).

The desirability of encoding variables for an entire project area by some spatially controlled unit finally became apparent to several archeological investigators (Lafferty and Solis 1979; Limp 1980, 1981; Limp, Lafferty and Scholtz 1981; Hay et al. 1982). The implications of measuring environmental variation for the entire project area (statistical universe) are several and are just beginning to be understood. One important implication is that survey bias can now be precisely measured (Lafferty 1981:164-191). This is giving rise to new statistical applications to measure more precisely the goodness of fit of different variable distribution curves (Parker 1984; Lafferty et al. 1984). Encoding the whole universe also allows for a precise application of the developed model to the whole universe (Lafferty et al. 1981, 1984; Lafferty and House 1984; Hay et al. 1982). The ongoing application of Geophysical Information Systems to this kind of predictive modeling is about to make the generation of the grids much less time consuming and will lead to an optimization of analysis unit size for different analyses and regions.

The early uses of regression analysis in settlement pattern analysis was accomplished to predict site size (Lafferty 1977) or the size of public investment in certain monuments (Steponaitis 1978). These were derived from geography and econometrics. In the field, particularly in the wooded east, it was often impossible to determine site size and linear regression analysis really was not the proper statistic. The Sparta predictive model made the first application of Multivariate Logistic Regression (Dunn n.d.; Scholtz 1980, 1981), which predicts a probability that an event will happen. This places the normal regression formula in an exponent in the denominator and results in a probability that there will be a site on a given unit of land. A less satisfactory solution has been to make the predicted variable be a percent of shovel tests with archeological materials (Hay et al. 1982).

To date, the development of predictive models over the past 35 years has resulted in delimiting a successful, statistically adequate set of procedures for predicting site locations that are theoretically adequate. At the present time, the two tests which have been made of the theory have failed to refute it (Lafferty 1977; Lafferty and House 1986).

The development of predictive models over the past 15 years has resulted in several procedures and approaches which to date have been successful. Basic requirements for predictive models include:

(1) a grid laid over the project area for spatial control with standard sized Units of Analysis

(2) a representative surveyed sample of the project area (Statistically it is desirable that more than 30 units have sites in them.)
(3) a selection of variables which influence settlement in the environment
(4) the set of variables input into the computer matrix for each Unit of Analysis
(5) an analysis of variable matrix for redundancy using factor analysis and/or correlation coefficients;
(6) an application of logistic regression to develop a model of site probabilities
(7) the application of the model to the unsurveyed universe to map probabilities which can then be used to guide further survey and project goals.

THEORETICAL CONSIDERATIONS

The predictive model which we have developed for the Tyronza Basin is based on the postulates of Rational Locational Choice economic theory (Arrow 1951; Gladwin 1970; Limp 1981; Limp et al. 1981; Walsh 1970; and a recent excellent summary by Limp and Carr 1985). This theoretical position postulates that human settlements are positioned in the landscape so that they have optimal access to critical resources necessary for survival. Such resources include water, good soil, safety, transportation routes and mineral resources. An important part of this postulate is the assumption that human beings tend to behave efficiently within the constraints of their technology and their culture to <u>satisfy</u> their needs (cf. Sahlins 1972; Judge 1971; Plog and Hill 1971; Christaller 1966; Lafferty 1977). This is <u>not</u> the law of least effort (Zipf 1949) or the "mini-max" assumption that humans will minimize effort to gain maximum returns. Optimization recognizes that several resources in any particular settlement may be important and the settlement will be located such that all of these are accessible enough to sustain the settlement, satisfying wants and needs.

If these places and decisions satisfy minimum needs then they will be successful. If they do not they will fail according to the Law of Cultural Dominance (Sahlins and Service 1960:69-92). For example, if there are two systems in competition - as in two societies at war - the one which is more efficient will prevail - everything else being equal (it seldom is). The evolution of these systems involves repeated choices by individuals over many years. Many of those choices that are successful become embedded in the tradition and are no longer a discussed point, for example, whether the band camps in the low spots or high spots. They remember that many people were killed when the water rose like it never had before when Uncle John Doe's band camped in the low spot.

Optimization recognizes the not so long established fact that certain resources are required more often than other resources (Malinowski 1966; Adams 1942). For example, the raising of certain plants or animals requires differing amounts of attention. These differences have lead to the placement of those requiring the most attention, such as the kitchen garden, or livestock, in closer proximity to the farmhouse than crops requiring less attention, such as grains, pastures, sugar maple groves or nut trees (Bylund 1960; Chisolm 1970). Which resources are critical is dependent upon: (1) the environment that the culture inhabits; (2) the technological level of the culture; (3) the type of settlement (and some of these are dependent on the technological level and degree of specialization present in a particular culture); and (4) the nontechnological aspects of the culture. All of these factors are interrelated in a complex manner through time with one influencing and changing the others. The implication of this complexity for settlement analysis is that those practices, settlements at locations which do not satisfy basic needs, will drop out of the culture or be replaced by those that do satisfy basic needs, in accordance with Sahlins' law of cultural dominance (Sahlins and Service 1960:69-92). While these factors are very complexly interrelated at several levels of abstraction, there are real, knowable, and measurable constraints that make modeling a majority of settlement systems possible from characteristics of the landscape.

Critical Resources

The literature on critical resources goes back to the 1930s (Malinowski 1966:91) and the functional school of anthropology. More recent applications of these needs recognize that they can be filled in a number of ways (Sahlins 1972) and that they apply only to locational properties of human settlements of particular sorts (Limp et al. 1981). Resources considered critical to selection of most settlements as specified for the Southeast are:

1. Permanent water
2. Food resources
    a. Flora
        (1). wild
        (2). domestic
    b. Fauna
        (1). wild
        (2). domestic
3. Firewood
4. Construction material
5. Location comfort
    a. Drainage
    b. Slope
    c. Exposure
        (1). Protection
        (2). Aspect
6. Hazard

These properties are based on Limp et al. (1981:69) following Lipe and Matson (1971:133-134), and Limp (1981:62-63). A nearly identical list is found in Malinowski (1966:91).

Landscapes and Environments

Resources are distributed differently in different environments; however, because of the three dimensional nature of our space on the surface of the planet, these have three finite geometric patterns: point, line, and area. With certain technologies some resources may be ubiquitous and not a constraint to settlement.

A permanent source of water has long been recognized as a prerequisite of human survival. Without water a human being dies in a few days. It is distributed on the planet as areas (oceans, lakes, ponds), lines (rivers and streams), and as points (waterholes, springs, cenotes). In some environments water is much more plentiful than in other areas, such as deserts. In the lower Mississippi River Valley water is quite common and was almost ubiquitous in predrainage times. Generally, in the southeastern U.S. water is most common as streams that intersect areas of land; however, with rather simple well digging technology, water is almost ubiquitously present from underground aquifers. In the modern landscape water is not presently a constraint to settlement and has not been since the drainage of the swamps.

In lowland environments a more serious constraint on settlement is the presence of areas of standing water and the high probability of flooding (i.e. too much water). Flooding is a hazard, which has been partially brought under control by the levees and dams constructed over the past century. The presence of water usually excludes the possibility of human settlements unless the culture possesses heavy duty watercraft technology (i.e., houseboats, houses on pilings, dredging/earthworks, etc.). The other side of the coin is that for large settlement to be present it is necessary to have large amounts of water available. This means that most cities prior to the industrial revolution were restricted to locations on or near rivers and lakes.

Food resources are areally bound resources; that is, they occupy space on the surface of the planet. Food may be either aquatic or terrestrial plants and animals, domestic or wild. Plants are tied to the landscape, and it is well established that there are differing floral communities with different species present in different climates and in different physiographies on the landscape. Soils have been shown to be indicative of former plant communities in the Lower Mississippi River Valley and elsewhere in the Southeast.

Firewood is a basic requirement in the Southeast. It is also an areally bound resource which is modeled similarly to food resources. In environments where wood is more circumscribed, it may be of critical importance to settlement location. Wood is and was ubiquitous in the Southeast and not a significant factor with the exception of large settlements or cities such as Cahokia. Modern technology has transferred the reliance on wood to fossil fuels.

Prehistoric construction materials consisted predominantly of wood in the Southeast and, as noted above, wood is an areally bound resource of great ubiquity in the southeast. This was not a constraint to settlement as it is in some areas. Clay and stone were also important in the preindustrial landscape. Again the ubiquity of this resource makes it irrelevant to modeling settlements in the Southeast.

Location comfort, which includes such factors as drainage, aspect, and slope, is differentially distributed in the environment and is embedded in the surficial topography of the soils and surface rocks. In the Mississippi lowlands drainage of soil appears to be of crucial importance. In more arid environments drainage would not be so important. In highly dissected areas, such as the Appalachian or Ozark Mountains, slope is more important as most places are well drained. In upland environments, aspect often makes a remarkable difference in summer or winter comfort. Protection from attack is also important, and its precise realization depends on the topography and the technology possessed by the attacking entities. For the lower Mississippi Valley, with transportation on the water courses this means passive protection could be afforded by building towns on the banks of oxbow lakes and in locations with maximum elevations. Prehistorically, the construction of mounds in Mississippian times often embodied a defensive structure. Protection from natural hazards is also an important consideration of settlement location. Fire, tornadoes, and flooding can often be guarded against by proper positioning of settlements. Improperly situated settlements do not, as a rule, last long.

In modern times many features of the landscape become irrelevant to the placement of settlements. In the past, however, variation in the distributions of these resources have strongly constrained human settlement. The manner in which these resources operated and affected different settlements in different cultures with different technologies has varied considerably through time.

Technological Levels

Technology in its broadest sense, that is, including its organizational aspect (cf. White 1949, 1959) can greatly modify the constraints the environment places on settlement. The ability to effect changes significant enough to affect large portions of the populations are largely restricted to the period after the industrial revolution.

Hydraulic works and the ability to control water are generally conceded to be products of civilizations and are still largely restricted to larger constraints of the environment. The control and transportation of water sources to urban areas is also a characteristic of state level societies. The most famous early examples of these are the Roman and Aztec aqueducts. Since tho advent of the industrial revolution, this control has become so ubiquitous that we often lose sight of how highly constrained good settlement locations once were. Even in the historic period in south (Lafferty et al. 1981, Lafferty and House 1986) and east Arkansas (Chapter 4), the first locations irrigated were usually adjacent to permanent natural water sources. One of the reasons that recent attempts to model the 19th-century rural landscape in Arkansas using natural variables has failed is probably the presence of well digging technology which made virtually any point in the lower Mississippi Valley and the West Coastal Plain inhabitable as far as a source of fresh water is concerned. Other cultural factors like the road network appear to be more important. Present evidence indicates that prehistoric control of water was in its infancy and consisted of excavations of canals, terraces and perhaps canoe harbors (Larson 1972; Hernandez de Biedma 1851; Kuttruff P.C.; Lafferty 1986).

Alteration of areally bound resources is a relatively recent phenomenon, with the notable exception of changes of plant communities due to fire and agriculture. More recent changes like land leveling, drainage of swamps, and large reservoir construction are all part of the post industrial landscape. For operational purposes we assume that in the East there was normal climax vegetation throughout most of the prehistoric past. This is not totally true, given the succession of the plant communities north with the recession of the continental ice sheets, the documented prehistoric impact on lowland plant communities during the Mississippian period (Chapman et al. 1982; Delcourt and Delcourt 1981), and the encouragement of many upland prairie areas due to the use of fire in hunting. These are temporary kinds of effects when compared to the drainage of the swamps and the precision landleveling which is likely to alter the soils permanently if maintained over a long period of time.

A very important part of exploiting areally bound resources is the ability to get across the landscape with speed. Increases in the speed of planting and harvesting engendered with the mechanical revolution has systematically reduced the number of persons necessary to cultivate a given area of land (Geerts 1963). This was not a factor in the prehistoric landscape but has been of crucial importance in the modern changes in the rural landscape with the introduction of the horse and later the tractor. Increases in transportation speed also has implications for the spacing of centers (cf. Barber 1971; Lafferty 1977; Lafferty et al. 1981, 1984, 1985b; Lafferty and House 1986).

The evolution of any particular human landscape involves the application of technology directed by the culture over a period of time. If the landscape is occupied for a long period of time, the effect on the environment, particularly the plants and animals, will be considerable. The mixes of plant communities as reconstructed for Mississippi County, Arkansas (Harris 1980; presented in Chapter 2), is not exactly the same as those done for adjacent areas (Butler 1972; Lewis 1974). There is good reason to believe that it takes 300- 500 years for climax vegetation to be established. There is archeological reason to believe that only one of three of these study areas was intensely occupied in that time span immediately preceding the GLO mapping, suggesting that slightly different successional stages were present. Therefore, what we are attempting to model is a potential natural state (Kuchler 1964) of vegetation, which was modified by technology. Given the larger constraints of the environment the potential natural state was strongly conditioned by what could be done on a particular piece of real estate. Therefore, even though the state of the environment is known to have changed in prehistoric times, there was a physical basis which structured settlement and land use. It is also true that there is a great deal of variability in settlement patterns, site types and their dispersion in space and through time. However, there are (as we have discussed above) certain needs common to all people which can be satisfied from only a finite environment with certain common spatial characteristics that make it possible to develop predictive models of the distributions of certain kinds of sites. Moreover, substantivist economics makes it clear that there are only three basic patterns of economic integration: reciprocity, redistribution and exchange (Polanyi 1968:128), having characteristics that make prediction possible for certain classes of sites.

Types of Sites

In human landscapes, particularly since the rise of specialization, there have evolved several different kinds of places. While these places are all produced by a series of choices made over long periods of time, their placement in the landscape is determined by different spatial parameters. This characteristic makes their locations predictable (explainable) by different variables. Specifically, the main kinds of places which have been identified and shown to be predictable by different variables are centers, areally bound places, and some point-bound places. The locations of these settlements are sensitive to economic choice and comprise most human settlements in most landscapes.

Our definition of these different kinds of places comes directly from Christaller's classic definition (1966). These definitions are well thought out and are etically congruent with the kinds of mathematical models we employ below. Christaller's definitions were exceedingly broad, which was surprising for me to find given his implicit assumption of a market economy. The employment of Optimization Rational Choice Theory allows choices which have elsewhere (Lafferty 1977:34-39) been generalized in terms of nonmarket economies. The restrictive assumptions, especially the Mini-Max assumption, are not necessary to invoke given the Law of Cultural Dominance and the fact that we are simply utilizing the definitions and not the spatial implications of the central places.

A central place is a location where goods and services are available which are not available at other locations. According to Christaller the purpose of a central place ". . is that which Gradmann has called the chief profession of a town, namely 'to be the center of its rural surroundings and mediator of local commerce with the outside world'" (1966:16, emphasis his). Crumley has extended this definition to include different functions (1976) integrated into several superimposed functional lattices. Christaller points out that centers may at times have much higher population densities, such as on market days or during religious ceremonies. Centers are located in such a way as to make them easily accessible. Christaller argued that this resulted in a series of nested hierarchically organized hexagonally shaped lattices in the ideal state (i.e., on an isotropic plane which does not occur on the planet). What is important here is that the locations and sizes of central places are dependent on the location of the center vis-a-vis other centers, the transportation technology used and the transportation routes. Therefore, these variables can be used to predict large site sizes, and require data sets encompassing regions or large parts of continents.

Dispersed places are in complementary distribution with centers. Dispersed places are:

> all those places which are not centers. They include: (1) areally bound ones -- those settlements the inhabitants of which live on their agricultural activities, which are conditioned by the land area surrounding them; and (2) point bound ones -- those settlements, the inhabitants of which make their living from resources found at specific locations. The latter are: the mining settlements which are very limited in space as compared to agricultural possibilities of the land, and generally are more point-like in their location in the country; and second, all those settlements which are bound to absolute points (not relative ones as in the case of central places) -- for instance, bridges and fords, border or custom places and especially harbors. Very often, harbors simultaneously become central settlements, whereas mining settlements and health resorts are seldom central places. Finally, (3) we have settlements which are not bound to a central point, an area, or an absolute point. Monastery settlements (but not shrines, which are usually bound by the place of the miracle) are examples (Christaller 1966:16-17).

Table 11. Ditch 10, 12 and 29 variable list

Columns	Variable	Codes and Meanings
1	Ditch/Lateral	D=Main Ditch L=Lateral
2-3	Ditch No.	0-99
4-5	Reach No.	0-99
6	Survey Status	1=Phase 1, Surveyed 2=State Site Files
7-10	UTM Easting	0-9999 hectometers, first 4 #, Z#15
11-15	UTM Northing	0-99999 hectometers, first 5#, Z#15
16-17	Soil Type	1=Alligator Clay (Aa) 2=Alluvial Land (Ad) 3=Amagon Sandy Loam (An) 4=Borrow Pit (Bp) 5=Bowdre Silty Clay Loam (Br) 6=Bruno-Crevasse (Bv) 7=Commerce Silt Loam (Cm) 8=Convent Fine Sandy Loam (Cn) 9=Crevasse Loamy Sand (Cr) 10=Crowley Silt Loam (Cw) 11=Dundee Silt Loam (Du & Dv) 12=Earle Clay (Ec) 13=Forestdale Silt Loam (Fe) 14=Forestdale Silty Clay Loam (Fo, Fr) 15=Hayti Fine Sandy Loam (Ha) 16=Iberia Clay (Ib) 17=Jeanerette Silt Loam (Je) 18=Morganfield (Mo) 19=Routon (Rd) 20=Sharkey (Sc, Sh, Sk, Sm, Sn) 21=Steele (So, Ss, St, Sr) 22=Tiptonville (Td) 23=Tunica (Tu)

Table 11 (Ctd.). Ditch 10, 12 and 29 variable list

Columns	Variable	Codes and Meanings
18	Topographic form	0=Negative Relief - higher ground in 2 or more directions 1=Flat - <1 contour line per unit 2=Slope - >1 contour line per unit 3=Positive relief - lower ground in 2 or more directions
19-20	Nearest Water	0-99 hectometers to Sharkey soils if unit is totally within code as 99.
21-22	Nearest Channel	0-99 hectometers. 0=unit partially contains channel, 1=100 hm to channel and 99=unit totally under water.
23	Surface	1=Channel [C] 2=Meander Belt [MB] 3=Relict Braided Surface [RBS] 4=Meander Scar [MS]
24	Ecotone	0=None 1=MB/RBS 2=C/MB 3=C/RBS 4=C/MB/RBS 5=MS/MB 6=MS/RBS 7=MS/MB/RBS
25-26	Elevation	0-99 encode only last 2 digits; Feet above mean sea level; all elevations preceded by "2".
27-28	Above low	0-99 elevation of unit above lowest point within 1 km radius, feet
29-30	Not used	

Table 11 (Ctd.). Ditch 10, 12 and 29 variable list

Columns	Variable	Codes and Meanings
31-33	Surface visibility	0-100%
34-35	Last agricultural treatment and Ground Cover	1=Plowed 2=Disced 3=Freshly Planted 4=Freshly Cultivated 5=Harvested 6=Sparse Row Crops (<50 cm) few weeds 7=Good Row Crops (50-100 cm) some weeds 8=Dense Row Crops (<100 cm) 9=Sparse pasture/lawn 10=Heavy pasture/lawn 11=Weeds 12=Leaf litter 13=Water
36	Rain since last surface treatment?	0=No Rain 1=Rain
37-38	Crop / Vegetation cover	1=Soybeans 2=Rice 3=Cotton 4=Milo 5=Winter Wheat 6=Corn 7=Alfalfa 8=Grass 9=Weeds 10=Forest 11=Borrow pit / pond 12=Nothing
39-44	Munsell Color Top soil layer Code Whole numbers i.e. 7 YR not 7.5YR	

Table 11 (Ctd.). Ditch 10, 12 and 29 variable list

Columns	Variable	Codes and Meanings
45	Soil Texture	1=Clay 2=Silty Clay 3=Clayey Silt 4=Silt 5=Sandy Silt 6=Silty/Fine Sand 7=Sand 8=Clayey Sand 9=Clay/Silt/Sand
46-47	Depth of soil break (cm)	
48	Nature of break	1=Mottled 2=Diffuse 3=Weak 4=Sharp
49-54	Munsell Color Second soil layer Code Whole numbers i.e. 7 YR not 7.5YR	
55	Soil Texture	1=Clay 2=Silty Clay 3=Clayey Silt 4=Silt 5=Sandy Silt 6=Silty/Fine Sand 7=Sand 8=Clayey Sand 9=Clay/Silt/Sand
56	0=Not Mottled 1=Weakly mottled 2=Moderately Mottled with 3=Strongly Mottled With	
57	1=Carbon 2=Manganese 3=Iron concretions 4=Calcium concretions 5=Burned Clay 6=Bog Iron and Manganese	
58-59	Depth of soil break (cm)	

Table 11 (Ctd.). Ditch 10, 12 and 29 variable list

Columns	Variable	Codes and Meanings
60	Sites	0=none present in Unit 1=Prehistoric 2=Historic 3=Both
	Site numbers (all prefixed by 3MS) in unit	
61-63		1-999
64-66		1-999
67-69		1-999
70-72	Site size	0-100% of unit has site
73-74	Site depth	0.0-9.9 meters

VARIABLES ENCODED

Table 11 presents all of the data encoded in the locational data matrix. This includes 158 units from the project area and 48 units from the state site files, mainly from the parallel Big Lake Transect located 1/4 mile south of Ditch 12. The data set currently consists of 206 records with 42 possible observations. Each record has all observations recorded for each of our 200 x 200m Units of Analysis (Units). There are four kinds of data entered: (1) unit/location control data, (2) environmental data used in the predictive model, (3) survey control data, and (4) archeological data. These are briefly summarized below.

Unit/locational data were encoded so that the data set could be partitioned in useful manners, and so that particular locations could be recovered. These data consisted of: (1) whether the unit was along a ditch or in the Big Lake Transect; (2) the ditch number and (3) the current Survey Status showing whether survey has been done in that particular unit or was from the State Site File Data Set. These data were used to partition the data set for model construction and other descriptive statistics used in this report (Chapters 2, 3, 5 and 7). The coordinates of the southwest corner of each grid unit were encoded by their Universal Transverse Mercator (UTM) Grid coordinates. This served as the name of each Unit of Analysis.

Environmental data were encoded to be used in the predictive model. The encoded variables were Soil type, Topographic form, Nearest water, Nearest channel, Geomorphic surface, Ecotone, Elevation, Low Point (position of unit in relation to the lowest point within a km radius). From the soils variable certain continuous variables were generated based on the soil type descriptions. These included yields of soybeans, cotton, and wheat, Soil pH, Water table depth, Depth to available water, Soil permeability, Soil capability class, and Biotic community. All of these variables are discussed in the next section in profound detail, and were the basis for the predictive model.

Survey control data for all of the units surveyed were recorded on day maps in order to assess the coverage of the project area (Chapter 3). The following information was encoded from this data for each unit surveyed: Surface visibility of each Unit, Last agricultural treatment in the transect, Rain since the last surface treatment, Current vegetation cover, Space between crew members (which was usually a function of corridor width and crew size), Subsurface data on soil texture, Munsell color, Depth of soil changes and structure for the upper two shovel tests. These data were then encoded after we returned from the field by overlaying the grid on the day maps.

Archeological data were recorded if sites were discovered in a transect. These were recorded in the data set when we encoded the survey information. This included the Site number, Site Type (whether it was prehistoric or historic site), Site size (an estimate of what percent of the unit it occupied), and Depth of the deposit, if known. Site type was utilized in the predictive model.

CRITICAL RESOURCES AND VARIABLES

When we began working on the Tyronza project in the fall of 1983, we did not know precisely what variables would be good predictors of site locations. Therefore we examined that project area's environments and by combining our knowledge of what had worked in Sparta, we selected a series of variables which we thought would be good predictors of site location (Table 12). All of these variables with the exception of Ecotone and Channel Distance are defined in the Tyronza Watershed reports (Lafferty et al. 1984: 86-122; 1985a:98-101). In this report we will discuss only the variables used in the predictive model. Many of the environmental variables first encoded in the Tyronza data sets were found to be redundant (i.e., co-linearly distributed) and were eliminated from the model.

One of the problems with this shotgun approach to predictive modeling is that with so many variables it is likely that many of them will be redundant. The first problem dealt with was to determine which of the variables were redundant and then to select the variable in each redundant group that was the best predictor of site location. This was not particularly straightforward because some of the variables, such as soil drainage, have qualities which are not exactly the same, while others, such as crop yield, were very highly correlated. Determining degrees of redundancy was rather straightforward by inspection of the correlation matrix and the factor analysis scores of the total data set. Determining which variable, if any, was the most important, was guided by the correlation between site type and how the variable fit into the Tyronza model. This eventually lead to the selection of the "Utilized Variables" listed on the right of Table 12.

Table 12. Critical Resources and Variables

Critical Resources	Encoded Variables	Utilized Variables
1. Permanent Water	Distance to H2O	
	Channel Distance	Channel Distance
2. Food Resources	Biotic Community	
	Ecotone	Ecotone No.
	Bu. Soybeans	
	Cwt. Cotton	Cwt. Cotton
	Bu. Wheat	
3. Firewood	(Relatively ubiquitous, Not Modeled)	
4. Construction Material	(Relatively ubiquitous, Not Modeled)	
5. Location comfort		
Drainage	Water Table	
	Depth to Water	
	Soil permeability	
	Soil pH	
Slope	Topo Form (Flat surface, no variation and not used)	
Exposure		
Protection	Low point	Low point
	Channel Distance	Channel Distance
Aspect	(Not measured - very slight)	
6. Hazard	(Not measured - redundant with Low Point)	

VARIABLE REDUNDANCY

Determining variable redundancy and the elimination of the redundant variables was carried out by inspecting the correlation matrix of the continuous variables in the data set (Table 13). All significantly correlated variable pairs (i.e., those with correlation coefficients more than the absolute value of 0.5 and level of chance correlation of less than 0.0001) were noted and compared. It was found that the related variables were the most highly and significantly correlated which supported the findings of the Tyronza Phase I factor analysis (Lafferty et al. 1984:124), and the Tyronza Phase II correlation matrix (Lafferty et al. 1985a: Appendix C).

Permanent Water

Two variables were included to reflect the availability of water to each location in the project area: (1) Distance to Water, and (2) Distance to the nearest course of the Mississippi River whether it was a modern or older scar. Both of these variables were encoded with "99" if the unit was totally under water. The correlation matrix indicated that Water Distance was redundant with Channel Distance with correlation coefficient of 0.8842. These were also highly correlated with Soil Permeability and pH Midpoint. Channel distance was retained because it correlated most highly with Prehistoric Sites.

Food Resources

Five variables were encoded to model the variation in the food resources (Table 12). All of the variables other than ecotone were derived from the soils types and showed a high degree of co-linearity. These five variables were all highly redundant, several pairs of variables with correlation coefficient of more than 0.9 were pulled out as one factor (Lafferty et al. 1984:124). Ecotone was not redundant with the more areal soils data. Biotic Community was most highly correlated with prehistoric site types and was retained for the model.

Firewood, construction materials and aspect were not measured because the former two are relatively ubiquitous and the latter is very slight and affords little or no protection.

Location comfort

Drainage was measured with four soils variables. These were all very highly correlated with each other and with the food resources derived from the soil types (Appendix C) and were sorted as a group into one factor in the Tyronza Basin (Lafferty et al. 1984:124). When included in a model these all had an insignificant Chi square and were not included in the model.

Table 13. Correlation of Variables Considered in Predictive Model

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
NEAR_H2O	206	28.35436893	40.46022624	5841.0000000	1.00000000	99.00000000
NR_CHAN	206	32.67961165	42.46644899	6732.0000000	1.00000000	99.00000000
ELEV	206	38.03883495	5.79221063	7836.0000000	30.00000000	96.00000000
LOW_PT	206	2.70388350	1.90370229	557.0000000	0.00000000	7.00000000
CHROMA1	154	3.45454545	0.62717240	532.0000000	2.00000000	5.00000000
SATRATN1	154	2.48051948	0.87984535	382.0000000	0.00000000	6.00000000
SOILDPH1	153	19.94117647	11.01866556	3051.0000000	0.00000000	65.00000000
CHROMA2	142	4.55633803	0.97139695	647.0000000	2.00000000	7.00000000
SATRATN2	142	2.71126761	1.52325233	385.0000000	0.00000000	6.00000000
SOILDPH2	110	41.10000000	10.69506445	4521.0000000	19.00000000	50.00000000
CWT_COT	206	561.55339806	120.80023648	115680.0000000	360.00000000	800.00000000
BU_SOY	206	32.52427184	4.74900690	6700.0000000	18.00000000	40.00000000
BU_WHEAT	206	35.66019417	5.78400384	7346.0000000	22.00000000	45.00000000
AVE_H2O	206	0.59674757	0.86201839	122.9300000	0.08000000	2.20000000
H2O_TBL	206	1.24708738	1.13359616	256.9000000	0.20000000	4.50000000
SOL_PERM	206	1.60796117	1.56099022	331.2400000	0.06000000	6.30000000
PH_MOPT	206	6.50388350	0.63667158	1339.8000000	5.60000000	7.30000000
PREHIST	206	0.23786408	0.42681269	49.0000000	0.00000000	1.00000000

Table 13. Correlation of Variables Considered in Predictive Model

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	NEAR_H2O	NR_CHAN	ELEV	LOW_PT	CHROMA1	SATRATN1	SOILDPH1	CHROMA2	SATRATN2	SOILDPH2
NEAR_H2O Nearest Water (hm to Sharkey soils)	1.00000 0.0000 206	0.88420 0.0001 206	0.05602 0.4239 206	-0.45835 0.0001 206	-0.09439 0.2443 154	-0.23220 0.0038 154	-0.25397 0.0015 153	0.02719 0.7480 142	-0.09064 0.2834 142	-0.10234 0.2874 110
NR_CHAN Nearest Channel (hm)	0.88420 0.0001 206	1.00000 0.0000 206	0.32390 0.0001 206	-0.49886 0.0001 206	-0.08125 0.3165 154	-0.22066 0.0060 154	-0.10968 0.1771 153	0.10375 0.2192 142	-0.06607 0.4346 142	-0.08649 0.3689 110
ELEV Elevation (ft. above mean sea level)	0.05602 0.4239 206	0.32390 0.0001 206	1.00000 0.0000 206	-0.04496 0.5211 206	-0.03684 0.6501 154	-0.03345 0.6805 154	0.23308 0.0037 153	0.13054 0.1215 142	-0.00238 0.9775 142	0.03830 0.6912 110
LOW_PT Elev. above low pt. w/in 1 km radius)	-0.45835 0.0001 206	-0.49886 0.0001 206	-0.04496 0.5211 206	1.00000 0.0000 206	0.05123 0.5281 154	0.22760 0.0045 154	0.08557 0.2930 153	-0.06499 0.4423 142	0.10460 0.2154 142	0.13878 0.1482 110
CHROMA1 Munsell Chroma, Top Soil Layer	-0.09439 0.2443 154	-0.08125 0.3165 154	-0.03684 0.6501 154	0.05123 0.5281 154	1.00000 0.0000 154	0.19382 0.0160 154	0.29495 0.0002 153	-0.05437 0.5205 142	-0.06705 0.4279 142	0.00032 0.9973 110
SATRATN1 Munsell Saturation, Top Soil Layer	-0.23220 0.0038 154	-0.22066 0.0060 154	-0.03345 0.6805 154	0.22760 0.0045 154	0.19382 0.0160 154	1.00000 0.0000 154	0.12927 0.1113 153	0.10302 0.2225 142	0.21514 0.0101 142	0.28208 0.0028 110
SOILDPH1 Soil Break Depth (cm), Top Soil Layer	-0.25397 0.0015 153	-0.10968 0.1771 153	0.23308 0.0037 153	0.08557 0.2930 153	0.29495 0.0002 153	0.12927 0.1113 153	1.00000 0.0000 153	0.04419 0.6016 142	0.10794 0.2010 142	0.35511 0.0001 110
CHROMA2 Munsell Chroma, 2nd Soil Layer	0.02719 0.7480 142	0.10375 0.2192 142	0.13054 0.1215 142	-0.06499 0.4423 142	-0.05437 0.5205 142	0.10302 0.2225 142	0.04419 0.6016 142	1.00000 0.0000 142	0.31543 0.0001 142	0.23824 0.0122 110
SATRATN2 Munsell Saturation, 2nd Soil Layer	-0.09064 0.2834 142	-0.06607 0.4346 142	-0.00238 0.9775 142	0.10460 0.2154 142	-0.06705 0.4279 142	0.21514 0.0101 142	0.10794 0.2010 142	0.31543 0.0001 142	1.00000 0.0000 142	-0.05164 0.5921 110
SOILDPH2 Soil Break Depth (cm), 2nd Soil Layer	-0.10234 0.2874 110	-0.08649 0.3689 110	0.03830 0.6912 110	0.13878 0.1482 110	0.00032 0.9973 110	0.28208 0.0028 110	0.35511 0.0001 110	0.23824 0.0122 110	-0.05164 0.5921 110	1.00000 0.0000 110
CWT_COT	-0.58642 0.0001 206	-0.64878 0.0001 206	-0.19515 0.0049 206	0.53506 0.0001 206	0.05028 0.5357 154	0.38147 0.0001 154	0.10581 0.1930 153	0.08014 0.3431 142	0.08258 0.3286 142	0.18275 0.0560 110
BU_SOY	-0.51704 0.0001 206	-0.63675 0.0001 206	-0.23306 0.0007 206	0.51042 0.0001 206	0.04648 0.5671 154	0.35955 0.0001 154	0.07666 0.3463 153	0.04424 0.6011 142	0.06830 0.4193 142	0.17572 0.0663 110
BU_WHEAT	-0.50794 0.0001 206	-0.52140 0.0001 206	-0.10342 0.1391 206	0.48611 0.0001 206	0.03457 0.6703 154	0.36662 0.0001 154	0.16038 0.0477 153	0.08084 0.3389 142	0.06194 0.4640 142	0.18683 0.0507 110

Table 13. Correlation of Variables Considered in Predictive Model

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PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	CWT_COT	BU_SOY	BU_WHEAT	AVL_H2O	H2O_TBL	SOL_PERM	PH_MDPT	PREHIST
SATRATN2 Munsell Saturation, 2nd Soil Layer	0.08258 0.3286 142	0.06830 0.4193 142	0.06194 0.4640 142	0.05965 0.4807 142	0.09217 0.2753 142	0.11056 0.1898 142	-0.10209 0.2267 142	0.01390 0.8696 142
SOILDPH2 Soil Break Depth (cm), 2nd Soil Layer	0.18275 0.0560 110	0.17572 0.0663 110	0.18683 0.0507 110	0.11269 0.2411 110	0.15125 0.1147 110	0.08936 0.3532 110	-0.15439 0.1073 110	0.02861 0.7667 110
CWT_COT	1.00000 0.0000 206	0.98153 0.0001 206	0.96183 0.0001 206	0.84979 0.0001 206	0.86041 0.0001 206	0.84376 0.0001 206	-0.96313 0.0001 206	0.21419 0.0020 206
BU_SOY	0.98153 0.0001 206	1.00000 0.0000 206	0.94561 0.0001 206	0.85793 0.0001 206	0.77248 0.0001 206	0.78580 0.0001 206	-0.95062 0.0001 206	0.20772 0.0027 206
BU_WHEAT	0.96183 0.0001 206	0.94561 0.0001 206	1.00000 0.0000 206	0.87399 0.0001 206	0.85907 0.0001 206	0.79165 0.0001 206	-0.87894 0.0001 206	0.16134 0.0205 206
AVL_H2O	0.84979 0.0001 206	0.85793 0.0001 206	0.87399 0.0001 206	1.00000 0.0000 206	0.83410 0.0001 206	0.87894 0.0001 206	-0.77677 0.0001 206	0.09068 0.1949 206
H2O_TBL	0.86041 0.0001 206	0.77248 0.0001 206	0.85907 0.0001 206	0.83410 0.0001 206	1.00000 0.0000 206	0.91941 0.0001 206	-0.78050 0.0001 206	0.13503 0.0530 206
SOL_PERM	0.84376 0.0001 206	0.78580 0.0001 206	0.79165 0.0001 206	0.87894 0.0001 206	0.91941 0.0001 206	1.00000 0.0000 206	-0.85002 0.0001 206	0.13142 0.0597 206
PH_MDPT	-0.96313 0.0001 206	-0.95062 0.0001 206	-0.87894 0.0001 206	-0.77677 0.0001 206	-0.78050 0.0001 206	-0.85002 0.0001 206	1.00000 0.0000 206	-0.22781 0.0010 206
PREHIST Prehistoric Site Found	0.21419 0.0020 206	0.20772 0.0027 206	0.16134 0.0205 206	0.09068 0.1949 206	0.13503 0.0530 206	0.13142 0.0597 206	-0.22781 0.0010 206	1.00000 0.0000 206

Table 13. Correlation of Variables Considered in Predictive Model

PEARSON CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	NEAR_H2O	NR_CHAN	ELEV	LOW_PT	CHROMA1	SATRATN1	SOILDPH1	CHROMA2	SATRATN2	SOILDPH2
AVL_H2O	-0.29748 0.0001 206	-0.34444 0.0001 206	-0.08930 0.2018 206	0.34515 0.0001 206	-0.07141 0.3788 154	0.24418 0.0023 154	0.04851 0.5515 153	0.10670 0.2063 142	0.05965 0.4807 142	0.11269 0.2411 110
H2O_TBL	-0.49033 0.0001 206	-0.39859 0.0001 206	-0.00147 0.9833 206	0.44479 0.0001 206	-0.01219 0.8807 154	0.33147 0.0001 154	0.10689 0.1885 153	0.19149 0.0224 142	0.09217 0.2753 142	0.15125 0.1147 110
SOL_PERM	-0.53880 0.0001 206	-0.50857 0.0001 206	-0.13028 0.0620 206	0.40604 0.0001 206	-0.05202 0.5217 154	0.25217 0.0016 154	0.07220 0.3752 153	0.15556 0.0645 142	0.11066 0.1898 142	0.08936 0.3532 110
PH_MDPT	0.67922 0.0001 206	0.76304 0.0001 206	0.28647 0.0001 206	-0.53191 0.0001 206	-0.05205 0.5214 154	-0.34793 0.0001 154	-0.10112 0.2136 153	-0.05587 0.5090 142	-0.10209 0.2267 142	-0.15439 0.1073 110
PREHIST Prehistoric Site Found?	-0.25857 0.0002 206	-0.30339 0.0001 206	-0.12609 0.0709 206	0.21919 0.0015 206	0.14842 0.0662 154	0.11487 0.1560 154	-0.01137 0.8890 153	0.00649 0.9389 142	0.01390 0.8696 142	0.02861 0.7667 110

	CWT_COT	BU_SOY	BU_WHEAT	AVL_H2O	H2O_TBL	SOL_PERM	PH_MDPT	PREHIST
NEAR_H2O Nearest Water (hm to Sharkey soils)	-0.58642 0.0001 206	-0.51704 0.0001 206	-0.50794 0.0001 206	-0.29748 0.0001 206	-0.49033 0.0001 206	-0.53880 0.0001 206	0.67922 0.0001 206	-0.25857 0.0002 206
NR_CHAN Nearest Channel (hm)	-0.64878 0.0001 206	-0.63675 0.0001 206	-0.52140 0.0001 206	-0.34444 0.0001 206	-0.39859 0.0001 206	-0.50857 0.0001 206	0.76304 0.0001 206	-0.30339 0.0001 206
ELEV Elevation (ft. above mean sea level)	-0.19515 0.0049 206	-0.23306 0.0007 206	-0.10342 0.1391 206	-0.08930 0.2018 206	-0.00147 0.9833 206	-0.13028 0.0620 206	0.28647 0.0001 206	-0.12609 0.0709 206
LOW_PT Elev. above low pt. w/in 1 km radius)	0.53506 0.0001 206	0.51042 0.0001 206	0.48611 0.0001 206	0.34515 0.0001 206	0.44479 0.0001 206	0.40604 0.0001 206	-0.53191 0.0001 206	0.21919 0.0015 206
CHROMA1 Munsell Chroma, Top Soil Layer	0.05028 0.5357 154	0.04648 0.5671 154	0.03457 0.6703 154	-0.07141 0.3788 154	-0.01219 0.8807 154	-0.05202 0.5217 154	-0.05205 0.5214 154	0.14842 0.0662 154
SATRATN1 Munsell Saturation, Top Soil Layer	0.38147 0.0001 154	0.35955 0.0001 154	0.36662 0.0001 154	0.24418 0.0023 154	0.33147 0.0001 154	0.25217 0.0016 154	-0.34793 0.0001 154	0.11487 0.1560 154
SOILDPH1 Soil Break Depth (cm), Top Soil Layer	0.10581 0.1930 153	0.07666 0.3463 153	0.16038 0.0477 153	0.04851 0.5515 153	0.10689 0.1885 153	0.07220 0.3752 153	-0.10112 0.2136 153	-0.01137 0.8890 153
CHROMA2 Munsell Chroma, 2nd Soil Layer	0.08014 0.3431 142	0.04424 0.6011 142	0.08084 0.3389 142	0.10670 0.2063 142	0.19149 0.0224 142	0.15556 0.0645 142	-0.05587 0.5090 142	0.00649 0.9389 142

Slope was controlled for by Topo form. In the Tyronza studies this was the most highly correlated variable with Site type, did not correlate significantly with any other environmental variable, and was not explainable by any of the "Factors". However, in the Ditch 29 data set, slope was all uniform surface. Due to this lack of variation it obviously was not significant and was not included in the model.

Protection from flooding was measured with Low Point, and indirectly by channel distance. These variables were not highly correlated with any other variable other than Site Type and were included in the model.

Hazard from attack as measured by High Point within 1 km was not measured because previous attempts resulted in this variable being redundant with Low Point (Lafferty et al. 1984 and 1985a).

In summary the encoding of a fairly large number of data categories and the application of data cleaning to these resulted in the establishment of a relatively nonredundant variable set, which sorted themselves according to the critical resource categories defined in the first part of this chapter. These results were consistent with the data and models developed in eastern Mississippi County. The variability exhibited in the Ditch 29 data base indicated that less variation was present than was present in the Tyronza Basin.

VARIABLES

Seven variables were retained to include in the model: Water distance, Low point, High point, Channel distance, Water table, Biotic community, and Number of ecozone. These variables were included as the first variables in the earlier full models and provide a measurement of a full range of important critical resources in this environment. Below we discuss the nature of each variable, and their distribution in the sample space.

Channel Distance (NR-CHAN)

The number of hectometers (1hm = 100m) to the closest channel was encoded for each unit. There were three possibilities in this project area. Big Lake Swamp, the Buffalo Creek Valley and Pemiscot Bayou. If a unit was totally in one of these features then this was encoded "99" to reflect the low probability of having a site present. If the feature was present in only a part of the unit it was encoded with a "1". This was encoded before Dr. Guccione's analysis was done, which indicated that previously Big Lake Swamp had extended east nearly to Pemiscot Bayou. We believe that this error has somewhat distorted the results.

Even so, nearly 1/4 of the units of analysis were under water at one time or another (Figure 27). Three locations with prehistoric sites and five locations with historic sites were

Figure 27. Histogram of Channel Distance for Each Site Type

FREQUENCY BAR CHART

SITE_TP	NR_CHAN	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
absent	1	17	17	8.25	8.25
	2	8	25	3.88	12.14
	3	7	32	3.40	15.53
	4	9	41	4.37	19.90
	5	7	48	3.40	23.30
	6	3	51	1.46	24.76
	7	1	52	0.49	25.24
	8	3	55	1.46	26.70
	9	1	56	0.49	27.18
	10	1	57	0.49	27.67
	11	0	57	0.00	27.67
	12	1	58	0.49	28.16
	13	1	59	0.49	28.64
	14	1	60	0.49	29.13
	15	1	61	0.49	29.61
	16	1	62	0.49	30.10
	17	1	63	0.49	30.58
	18	1	64	0.49	31.07
	19	1	65	0.49	31.55
	20	1	66	0.49	32.04
	21	1	67	0.49	32.52
	22	0	67	0.00	32.52
	23	1	68	0.49	33.01
	24	2	70	0.97	33.98
	25	1	71	0.49	34.47
	99	51	122	24.76	59.22
prehistoric	1	11	133	5.34	64.56
	2	5	138	2.43	66.99
	3	6	144	2.91	69.90
	4	3	147	1.46	71.36
	5	2	149	0.97	72.33
	6	2	151	0.97	73.30
	7	1	152	0.49	73.79
	8	0	152	0.00	73.79
	9	0	152	0.00	73.79
	10	0	152	0.00	73.79
	11	0	152	0.00	73.79
	12	0	152	0.00	73.79
	13	0	152	0.00	73.79
	14	0	152	0.00	73.79
	15	0	152	0.00	73.79
	16	0	152	0.00	73.79
	17	0	152	0.00	73.79
	18	2	154	0.97	74.76
	19	0	154	0.00	74.76
	20	0	154	0.00	74.76
	21	0	154	0.00	74.76
	22	1	155	0.49	75.24
	23	0	155	0.00	75.24
	24	0	155	0.00	75.24
	25	0	155	0.00	75.24
	99	3	158	1.46	76.70

Nearest Channel (hm)

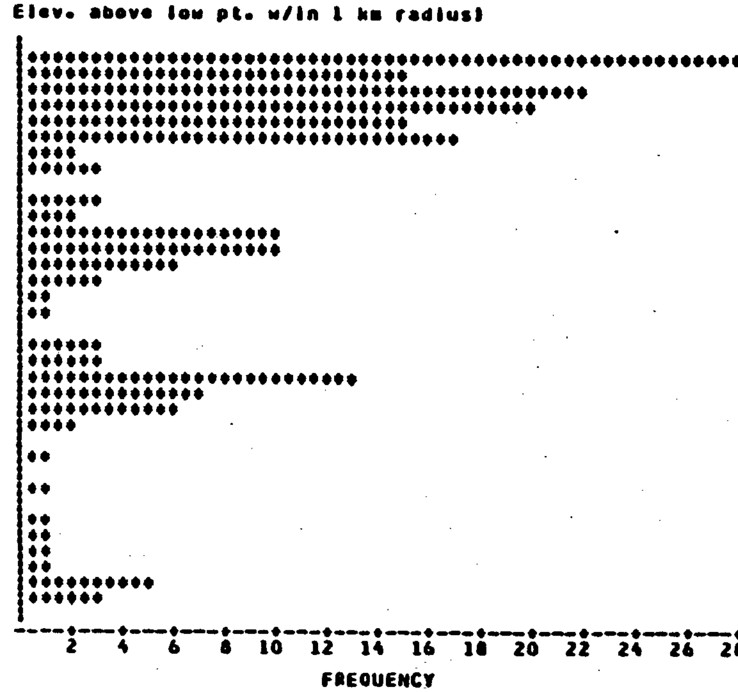
Figure 27. Histogram of Channel Distance for Each Site Type

```
                                                                                          8
                                                      11:49 MONDAY, NOVEMBER 24, 1986
historic      1 |******                                    6  164  2.91   79.61
              2 |**                                        2  166  0.97   80.58
              3 |**                                        2  168  0.97   81.55
              4 |*                                         1  169  0.49   82.04
              5 |                                          0  169  0.00   82.04
              6 |****                                      4  173  1.94   83.98
              7 |**                                        2  175  0.97   84.95
              8 |                                          0  175  0.00   84.95
              9 |*                                         1  176  0.49   85.44
             10 |**                                        2  178  0.97   86.41
             11 |**                                        2  180  0.97   87.38
             12 |                                          0  180  0.00   87.38
             13 |**                                        2  182  0.97   88.35
             14 |                                          0  182  0.00   88.35
             15 |                                          0  182  0.00   88.35
             16 |                                          0  182  0.00   88.35
             17 |                                          0  182  0.00   88.35
             18 |                                          0  182  0.00   88.35
             19 |**                                        2  184  0.97   89.32
             20 |                                          0  184  0.00   89.32
             21 |**                                        2  186  0.97   90.29
             22 |*                                         1  187  0.49   90.78
             23 |*                                         1  188  0.49   91.26
             24 |                                          0  188  0.00   91.26
             25 |                                          0  188  0.00   91.26
             99 |*****                                     5  193  2.43   93.69
both          1 |*****                                     5  198  2.43   96.12
              2 |                                          0  198  0.00   96.12
              3 |***                                       3  201  1.46   97.57
              4 |**                                        2  203  0.97   98.54
              5 |*                                         1  204  0.49   99.03
              6 |**                                        2  206  0.97  100.00
              7 |                                          0  206  0.00  100.00
              8 |                                          0  206  0.00  100.00
              9 |                                          0  206  0.00  100.00
             10 |                                          0  206  0.00  100.00
             11 |                                          0  206  0.00  100.00
             12 |                                          0  206  0.00  100.00
             13 |                                          0  206  0.00  100.00
             14 |                                          0  206  0.00  100.00
             15 |                                          0  206  0.00  100.00
             16 |                                          0  206  0.00  100.00
             17 |                                          0  206  0.00  100.00
             18 |                                          0  206  0.00  100.00
             19 |                                          0  206  0.00  100.00
             20 |                                          0  206  0.00  100.00
             21 |                                          0  206  0.00  100.00
             22 |                                          0  206  0.00  100.00
             23 |                                          0  206  0.00  100.00
             24 |                                          0  206  0.00  100.00
             25 |                                          0  206  0.00  100.00
             99 |                                          0  206  0.00  100.00
                 ----+----+----+----+----+----+----+----+----+----+
                     5   10   15   20   25   30   35   40   45   50
```

Figure 28. Histogram of Distance Above Low Point for Each Site Type

11:49 MONDAY, NOVEMBER 24, 1986 9

FREQUENCY BAR CHART



SITE_TP	LOW_PT	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
absent	0	28	28	13.59	13.59
	1	15	43	7.28	20.87
	2	22	65	10.68	31.55
	3	20	85	9.71	41.26
	4	15	100	7.28	48.54
	5	17	117	8.25	56.80
	6	2	119	0.97	57.77
	7	3	122	1.46	59.22
prehistoric	0	3	125	1.46	60.68
	1	2	127	0.97	61.65
	2	10	137	4.85	66.50
	3	10	147	4.85	71.36
	4	6	153	2.91	74.27
	5	3	156	1.46	75.73
	6	1	157	0.49	76.21
	7	1	158	0.49	76.70
historic	0	3	161	1.46	78.16
	1	3	164	1.46	79.61
	2	13	177	6.31	85.92
	3	7	184	3.40	89.32
	4	6	190	2.91	92.23
	5	2	192	0.97	93.20
	6	0	192	0.00	93.20
	7	1	193	0.49	93.69
both	0	1	194	0.49	94.17
	1	0	194	0.00	94.17
	2	1	195	0.49	94.66
	3	1	196	0.49	95.15
	4	1	197	0.49	95.63
	5	1	198	0.49	96.12
	6	5	203	2.43	98.54
	7	3	206	1.46	100.00

located in areas which were underwater at one time or another. It is probable that especially in Big Lake Swamp there are islands and remnant levees which were somewhat higher than the surrounding lowlands. This variable is significantly and negatively correlated with the occurrence of prehistoric sites (i.e., the closer one is to a channel the more likely there is to be a site).

Low Point (LOW_PT)

Low Point was recorded as the difference in feet between the elevation of the unit and the lowest point within a 1km radius of the unit. This variable systematically measures variation in local elevation and keys each unit into its relative position with respect to the lowest point in the nearby topography. This included the bottoms of the ditches (but not the spoil piles) and, therefore, may not be metrically equivalent to the predrainage landscape. It will be systematically representative of the variation present and serves at least as a relative index of how dry units were with respect to each other. This variable has been one of the most important variables with respect to all of the predictive models generated in all projects. Its importance is not surprising in this environment which is quite wet. Its high explanatory power in the models is intuitively satisfying and a real test of the "Dry Foot Hypothesis." A very low score for this variable means that the unit is as low in the landscape as is possible, while a high score means that a variable is quite high in the landscape.

Low Point distances ranged between 0 and 22 (Lafferty et al. 1985a: Table 12) in the Tyronza watershed but only between 0 and 7 feet in the Ditch 29 project area (Figure 28 and Table 14).

Ecotones in Unit (ECOT)

This variable simply reflects the number and type of ecotones in the unit and, therefore, is an indication of ecotones and environmental diversity. Theoretically, there were seven different ecotones possible in the project area; however, in reality there were only two (Figure 29). Over 70% of all units have no ecotones. The junction between the Relict Braided Surface and channels was an important determinant of site locations with over half of this ecotone having sites in them. This has a significant correlation between prehistoric sites being present on the indicated ecotone (Table 15). This variable did not correlate highly with any of the other variables other than site type.

Table 14. Descriptive Statistics for Variables Considered in Predictive Model

VARIABLE	LABEL	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
NEAR_H2O	Nearest Water (hm to Sharkey soils)	206	28.35436893	40.46022624	1.00000000	99.00000000
NR_CHAN	Nearest Channel (hm)	206	32.67961165	42.46644899	1.00000000	99.00000000
ELEV	Elevation (ft. above mean sea level)	206	38.03883495	5.79221063	30.00000000	96.00000000
LOW_PT	Elev. above low pt. w/in 1 km radius)	206	2.70388350	1.90370229	0.00000000	7.00000000
CHROMA1	Munsell Chroma, Top Soil Layer	154	3.45454545	0.62717240	2.00000000	5.00000000
SATRATN1	Munsell Saturation, Top Soil Layer	154	2.48051948	0.87984535	0.00000000	6.00000000
SOILDPH1	Soil Break Depth (cm), Top Soil Layer	153	19.94117647	11.01866556	0.00000000	65.00000000
CHROMA2	Munsell Chroma, 2nd Soil Layer	142	4.55633803	0.97139695	2.00000000	7.00000000
SATRATN2	Munsell Saturation, 2nd Soil Layer	142	2.71126761	1.52325233	0.00000000	6.00000000
SOILDPH2	Soil Break Depth (cm), 2nd Soil Layer	110	41.10000000	10.69506445	19.00000000	50.00000000
CWT_COT		206	561.55339806	120.80023648	360.00000000	800.00000000
BU_SOY		206	32.52427184	4.74900690	18.00000000	40.00000000
BU_WHEAT		206	35.66019417	5.78400384	22.00000000	45.00000000
AVC_H2O		206	0.59674757	0.86201839	0.08000000	2.20000000
H2O_TBL		206	1.24708738	1.13359616	0.20000000	4.50000000
SOL_PERM		206	1.60796117	1.56099022	0.06000000	6.30000000
PH_MDPT		206	6.50388350	0.63667158	5.60000000	7.30000000
PREHIST	Prehistoric Site Found?	206	0.23786408	0.42681269	0.00000000	1.00000000

```
                                  FREQUENCY BAR CHART

SITE_TP      ECOT     Ecotone                                                          FREQ  CUM.  PERCENT    CUM.
                                                                                             FREQ           PERCENT

absent       none     |**************************************************              100   100    48.54    48.54
             MB/RBS   |******                                                           11   111     5.34    53.88
             C/RBS    |******                                                           11   122     5.34    59.22
prehistoric  none     |***********                                                      22   144    10.68    69.90
             MB/RBS   |                                                                  0   144     0.00    69.90
             C/RBS    |*******                                                          14   158     6.80    76.70
historic     none     |**************                                                   28   186    13.59    90.29
             MB/RBS   |*                                                                 1   187     0.49    90.78
             C/RBS    |***                                                               6   193     2.91    93.69
both         none     |****                                                              8   201     3.88    97.57
             MB/RBS   |                                                                  0   201     0.00    97.57
             C/RBS    |***                                                               5   206     2.43   100.00
                      |
                      ----+----+----+----+----+----+----+----+----+----+
                         10   20   30   40   50   60   70   80   90  100

                                       FRECUENCY
```

Figure 29. Ecotones in relationship Site Type.

Table 15. Crosstabulation of Ecotones with Site Types

TABLE OF ECOT BY PREHIST

ECOT(Ecotone) PREHIST(Prehistoric Site Found)

FREQUENCY / PERCENT / ROW PCT / COL PCT	no	yes	TOTAL
none	128 62.14 81.01 81.53	30 14.56 18.99 61.22	158 76.70
MB/RBS	12 5.83 100.00 7.64	0 0.00 0.00 0.00	12 5.83
C/RBS	17 8.25 47.22 10.83	19 9.22 52.78 38.78	36 17.48
TOTAL	157 76.21	49 23.79	206 100.00

STATISTICS FOR TABLE OF ECOT BY PREHIST

STATISTIC	DF	VALUE	PROB
CHI-SQUARE	2	22.443	0.000
LIKELIHOOD RATIO CHI-SQUARE	2	22.642	0.000
MANTEL-HAENSZEL CHI-SQUARE	1	16.705	0.000
PHI		0.330	
CONTINGENCY COEFFICIENT		0.313	
CRAMER'S V		0.330	

SAMPLE SIZE = 206

Cotton yields and site type (CWT_COT)

As we saw above, Cotton Yields were most highly correlated with the occurrence of site types (Table 14) and was highly redundant with the other measures of areal resources productivity. Over half of the two highest productive soils had archeological sites on them. Most of the prehistoric sites were located on the better soil types, with only 6 of 49 prehistoric components located on the lower productivity soils.

Histogram of Cotton Yields for Each Site Type

FREQUENCY BAR CHART

SITE_TP	CWT_COT	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
absent	360	2	2	0.97	0.97
	430	45	47	21.84	22.82
	490	8	55	3.88	26.70
	550	44	99	21.36	48.06
	750	22	121	10.68	58.74
	800	1	122	0.49	59.22
prehistoric	360	0	122	0.00	59.22
	430	5	127	2.43	61.65
	490	0	127	0.00	61.65
	550	22	149	10.68	72.33
	750	8	157	3.88	76.21
	800	1	158	0.49	76.70
historic	360	0	158	0.00	76.70
	430	6	164	2.91	79.61
	490	2	166	0.97	80.58
	550	17	183	8.25	88.83
	750	10	193	4.85	93.69
	800	0	193	0.00	93.69
both	360	0	193	0.00	93.69
	430	1	194	0.49	94.17
	490	0	194	0.00	94.17
	550	4	198	1.94	96.12
	750	6	204	2.91	99.03
	800	2	206	0.97	100.00

5 10 15 20 25 30 35 40 45

FREQUENCY

Figure 30. Cotton yields and Site Types.

The four above variables were selected because of their low co-linearity with each other and high correlation with site type. Not suprisingly, especially given our work in the Tyronza Basin, these were sorted out into theoretically explainable groups which also corresponded to the factor analysis groups generated in the Tyronza work. In the next section we will discuss the nature of the model we have generated and compare it with the models developed for the Tyronza Basin.

SITE LOCATION PREDICTIVE MODELS

All of the biophysical variables encoded into the data set were used to develop the predictive model. The predictive model used is logistic regression which takes the form:

$$P = \frac{1}{1 + e^{(+ x)}}$$

Where P is the probability of the predicted event occurring

and e=2.71828, the base of natural logarithms

and is the constant or intercept of the Y axis on a cartesian plane

and $_1$, $_2$,... $_n$ are weights or beta regression coefficients

and $x_1, x_2, \ldots x_n$ are the explanatory variables

This algorithm places the normal linear regression formula as an exponent of the denominator which makes the predicted values vary between 0 and 1, which are properly interpreted as probabilities.

The data set used to generate the regression model included all of the surveyed area plus the 48 units from the state site files with sites. The units with historic sites were included as no sites present. This resulted in 206 units used in the model.

Four variables were selected for model development based on the analysis for redundancy. The computer selected variables with the highest correlations and most significant Chi-square value and continued adding variables until the excluded variables were not significant at the .0500 level. Ten variables were excluded from the model: Near-Water, High-Pt, Water Table, Elevation, Soybean Yield, Wheat Yield, Soil Permeability, Soil pH, Available Water and Econo. Four variables were included in the prehistoric model, which is shown on Table 16.

Table 16. Alpha and beta coefficients for the prehistoric logistic equation

Parameter		Coefficient
Intercept (Alpha)		-1.47755030
Betas:	Channel RBS Ecotone (C_RBS)	0.45660104
	Cotton Yield (CWT_COT)	0.06119333
	Low point within 1 km (LOW_PT)	0.12838319
	Hm to nearest channel (NR_CHAN)	-0.82570791

The variables in the above model have all been standardized. This means that the beta coefficients in Table 16 are directly comparable, making it possible to interpret the model. The variable with the largest absolute beta coefficient makes the greatest contribution to the model (Hm to nearest channel) and that with the lowest absolute beta coefficient makes the least contribution (Cotton Yield). The negative weight assigned NR_CHAN indicates that sites tend to be located on near channels. The positive weight assigned Low point indicates that sites are located high above the lowest point in the local landscape. As with the previous model developed for the Tyronza projects (Lafferty et al. 1984; 1985a) this model is intuitively satisfying and in operational accordance with the "Dry Foot Hypothesis," which states that Mississippian period sites in the Black Bottom of southern Illinois are located on high dry locations adjacent to friable soils (cf. Lafferty 1977; Muller 1978).

The computer program (Statistical Analysis System's PROC LOGIST) furnishes a goodness of fit test for the model. This produced a Chi square value of 31.40 with 4 degrees of freedom. This score indicates that the model is discriminating between correct positive responses and correct negative responses at the 0.0001 level of significance. The classification table shown in Table 17 presents the results of the model applied to the data set which is plotted in Figure 30.

The model, as mentioned earlier, predicts probabilities ranging from 0 to 1. In order to separate the positive responses from the negative ones, a decision point of .50 is used by PROC LOGIST. All scores equal to or greater than .50 are classified as positive responses and those lower than .50 are classified as negative responses. For management purposes a slightly lower threshold might be chosen to make sure that no sites were missed. Examination of the data set indicates that lowering the cutoff to 0.4 would result in the loss of no sites other than isolated finds.

Comparison of this model and those developed earlier in the Tyronza projects indicates that the model pulled out the same kinds of variables. Low point and Channel distance (previously called scar distance) were the same in both models and weighted in the same direction. Biotic community was a new variable developed for the Tyronza project and, given the opposite meanings of the variables are assigned betas in the same direction for the soils variables previously used in the Phase I Tyronza model and the Ditch 29 Model (CWT [hundred weight] of cotton and soil pH).

These three models are therefore comparable in details, however, the Phase II Tyronza model, given the greater data base on which it was developed, appears to be more powerful, having a much higher Chi square and specificity than the Ditch 29 Model.

Table 17. Prehistoric predictive model results

Logit Predictive Model for Whether or Not Prehistoric Sites Found

LOGISTIC REGRESSION PROCEDURE

DEPENDENT VARIABLE: PREHIST Prehistoric Site Found

```
206 OBSERVATIONS
157  PREHIST =  0
 49  PREHIST =  1
  0 OBSERVATIONS DELETED DUE TO MISSING VALUES
```

VARIABLE	MEAN	MINIMUM	MAXIMUM	S. D.
NR_CHAN	-7.841E-08	-0.745992	1.56171	1
C_RBS	1.852E-08	-0.459061	2.16779	1

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPT ONLY= 226.03

```
MODEL CHI-SQUARE=   30.66 WITH   2 D.F.   (SCORE STAT.) P=0.0000.
CONVERGENCE IN  6 ITERATIONS WITH  0 STEP HALVINGS        R= 0.357.
MAX ABSOLUTE DERIVATIVE=0.1C22D-06.                -2 LOG L=  193.25.
MODEL CHI-SQUARE=   32.77 WITH   2 D.F.   (-2 LOG L.R.) P=0.0000.
```

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
INTERCEPT	-1.47563494	0.22487965	43.06	0.0000	
NR_CHAN	-0.93097583	0.29854877	9.72	0.0018	-0.185
C_RBS	0.46198915	0.15513024	8.87	0.0029	0.174

CLASSIFICATION TABLE

		PREDICTED NEGATIVE	PREDICTED POSITIVE	TOTAL
TRUE	NEGATIVE	142	15	157
	POSITIVE	30	19	49
	TOTAL	172	34	206

SENSITIVITY: 38.8% SPECIFICITY: 90.4% CORRECT: 78.2%
FALSE POSITIVE RATE: 44.1% FALSE NEGATIVE RATE: 17.4%

C=0.757 SOMER DYX=0.514 GAMMA=0.549 TAU-A=0.187

CHAPTER 7

INTERPRETATION OF HOLOCENE VEGETATION IN NORTHEASTERN ARKANSAS

by

Linda J. Scott

and

D. Kate Aasen

INTRODUCTION

Changes in the Holocene vegetation have not been widely studied in the southern Midwest. Palynological studies of two locations, Big Lake and Pemiscot Bayou in northeastern Arkansas, represent a vegetational sequence for the past approximately 9000 years. This study was undertaken as part of a greater examination of cultural resources and the geomorphology of Ditches 10, 12, and 29 in Mississippi County, Arkansas. The cores from Big Lake and Pemiscot Bayou represent vegetational changes in the northern portion of the Southern Forest in the Mississippi Valley. Previous studies at Big Lake, Arkansas yielded a pollen column than encompassed only the past 180 years. The pollen record obtained from this study of Big Lake represents at least 9000 years of vegetation change, while that from nearby Pemiscot Bayou represents at least 8500 years. These records span a period beginning prior to the mid-Holocene warm/dry interval which has been referred to as the Hypsithermal (Deevey and Flint 1957), the altithermal (Antevs 1948), and the xerothermic (Sears 1942), to the present.

METHODS

The pollen was extracted from soil samples submitted by Mid-Continental Research Associates from northeastern Arkansas. A chemical extraction technique based on flotation is the standard preparation technique used in this laboratory for the removal of the pollen from the large volume of sand, silt, and clay with which they are mixed. This particular process was developed for extraction of pollen from soils where preservation has been less than ideal and pollen density is low.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. Zinc bromide (density 2.0) was used for the flotation process. All samples received a short (30 minute) treatment in hot hydrofluoric acid to remove any remaining inorganic particles. The samples were then acetolated for 2 minutes to remove any extaneous organic matter.

A light microscope was used to count the pollen to a total of 100 to 200 pollen grains at a magnification of 430x. Pollen preservation in these samples varied from good to poor. Comparative reference material collected at the Intermountain Herbarium at Utah State University and the University of Colorado Herbarium was used to identify the pollen to the family, genus, and species level, where possible.

Due to the abundance of Isoetes microspores in some of the core sediments from both Pemiscot Bayou and Big Lake, this taxa was excluded from the total pollen sum. The frequency of Isoetes was calculated separately on the same base as the pollen sum.

DISCUSSION

Arkansas is part of the Southern Floodplain Forest Section of the Southeastern Mixed Forest Province. Irregular Gulf Coastal Plains and Piedmont comprise this province where 50 to 80% of the relief are gentle slopes. Relief varies between 100 and 600 feet (30 to 180m) on the Gulf Coastal Plains and 300 to 1000 feet (90 to 300m) on the Piedmont. The flatter coastal plains have gentle slopes and local relief of less than 100 feet (30m). Streams within this province are sluggish, and marshes, lakes and swamps are numerous.

Arkansas enjoys a basically subtropical climate, as does most of the southern Atlantic and Gulf coastal United States. This pattern is characterized by absence of really cold winters, and the presence of high humidity especially in summer (Bailey 1980: 22-25). The subtropical climate is approximately uniform throughout the Southern Mixed Forest Province. Winters are mild, and summers are hot and humid. The average annual temperature is 60 to 70 F (15 to 21 C), while precipitation averages 20 to 60 inches annually. This rainfall is fairly evenly distributed throughout the year, but peaks occur in mid-summer or early spring when most of the rain falls in thunderstorms. Precipitation in this region exceeds evaporation, but summer droughts do occur. Growing season is approximately 200 to 300 days. While frost occurs nearly every winter, snow is rare in the Southestern Mixed Forest Province.

The eastern United States, although now farmland and secondary forest, was largely a region of deciduous forest at the time of European settlement. Vegetation in the area of Arkansas from which the cores were taken may be characterized as a Southern Mixed Forest. Southern Mixed Forest comprises approximately one third of Arkansas's east half. A wedge of oak and pine forest dominates to the south covering Arkansas's southwestern flank. To the north, and extending over northwestern and central Arkansas, a deciduous forest-prairie mosaic dominates (M. Davis 1983:166). This region of northwestern and central Arkansas is a mosaic of forest and scub interspersed with areas of prairie.

Braun (19[illegible]) and Kuchler (1964) have mapped and described the vegetation of the eastern United States. However, few quantitative data on forest composition are available. Regional maps of natural or potential vegetation are generalizations expanded from detailed studies of old growth forest thought to be representative of natural vegetation. Relatively little is known of the way in which modern secondery or tertiary forests differed from the original forest which covered this region. There are problems with reconstructing the forest history of the region whose modern vegetation is so poorly understood.

The southeastern United States is thought to have served as the principle proglacial refuge for plant and animal taxa that recolonized deglaciated landscapes during interglacial times. The Southeast contains a diversity of physiographic regions and plant communities, richness of woody and herbaceous plants, and a large number of endemic plant species (Delcourt and Delcourt 1985:1). Lake and bog environments thought to be suitable for plant fossil preservation were considered to be extremely scarce south of the glacial margin, with the exceptions of the "Carolina Bay" lakes along the Atlantic coastal plains (Buell 1939, 1945a, 1945b, 1946), and of the karst ponds in the lake districts of Florida, where early palynological research was focused. Early research outside these two regions focused initially on coastal peat deposits (J. Davis 1946), river terrace deposits with organic lenses associated with Pleistocene megafaunal assemblages (Brown 1938), or preliminary analysis of isolated peat bogs (Sears and Couch 1932; Sears 1935; Potzger and Tharp 1943, 1947). All of these studies have allowed broad patterns of late Quaternary vegetational and climatic change for the Southeast to be reconstructed (Delcourt and Delcourt 1985:2; Whitehead 1973; M. Davis 1976, 1981, 1983; Delcourt and Delcourt 1979, 1981, 1983, 1984a, 1984b).

Numerous pollen studies document the movement of vegetation across the Southeast during the Quaternary period. By 16,500 BP, climatic amelioration following the full-glacial had already begun at sites located near the southern boundary of the boreal forest. A decline in the dominance of diploxylon pine accompanied increasing populations of more mesic boreal and cool deciduous taxa (Delcourt and Delcourt 1985:18). Spruce and fir frequencies increased during the Late Wisconsin late-glacial interval (16,500 to 12,500 BP). Delcourt and Delcourt (1985) interpret the expansion of *Picea* and *Abies* to indicate cool climatic conditions and increased precipitation during the summer gowing season. On the uplands adjacent to the Lower Mississippi Alluvial Valley, cool temperate deciduous trees increased during the late-glacial and warm temperate taxa began a northward migration (Delcourt et al. 1980). As the climate became warm during the transition between the full-glacial and late-glacial, deciduous trees within Alabama, Georgia, and South Carolina moved from their glacial refuges and migrated northward. Later, the transition between the Pleistocene and Holocene (12,500 BP) is marked by a change in dominance from boreal to temperate plant communities. Towards the end of this interval, oak (*Quercus*) and hickory (*Carya*) expanded to accomodate the increasing mean temperatures and the extended growing season. Boreal species could no longer tolerate the ameliorating climatic conditions.

During the Early Holocene Interval (12,500 to 8500 BP), cool temperate mesic trees continued their northward expansion throughout the mid-latitude southeastern United States. Early Holocene forests, however, were different in composition and major dominants than those of the later Holocene (Delcourt and Delcourt 1985:19). By 10,000 years ago pine and spruce forests were replaced by deciduous forests of white pine, hemlock, and beech (Whitehead 1981). Pollen records from sites that span the 12,500 to 8500 year period (Anderson Pond, White Pond, Cahaba Pond) show that *Ostrya/Carpinus* dominated the pollen spectra (Delcourt 1979). At Cahaba Pond, beech pollen dominated along with a significant amount of hornbeam, oak, hickory, elm, and ash betweem 12,000 and 10,200 (Delcourt et al. 1983). Different from the forests of today, species of mixed coniferous and broadleaf deciduous occurred together. Bald cypress (*Taxodium distichum*), a coastal species, extended inland during this time period, and white pine (*Pinus strobus*) and hemlock (*Tsuga*) ranged southward of their present extent into central Alabama. Late Wisconsin forests in Tennessee contained ironwood, which coontributed 20% of the arboreal pollen between 12,500 and 9000 years ago (M. Davis 1983: 172). Delcourt (1979) interprets the larger frequencies of ironwood pollen between 12,000 and 9000 years ago as evidence for mesic conditions relative to the present climate of Tennessee. Other arboreal contibutors included spruce, oak, hickory, sugar maple, white ash, elm, fir, and many mesic taxa. Pine pollen, however, is absent. This forest was replaced 9000 years ago by a xeric assemblage dominated by oak and sweet gum (Delcourt 1979). Farther north in the West Virginian Mountains, deciduous forest had expanded by 12,000 years ago (Watts 1979). Oak, hemlock, and hickory replaced spruce and pine in the valleys of Virginia (Craig 1969).

Modern floristic regions developed in the late and middle Holocene as conditions changed from cool-temperate to warm-temperate. The Prairie expanded eastward in the midwestern United States during the Middle Holocene Interval (8500 to 4000 BP). Mesic forests were replaced by a xeric woodland of oak and pine approximately 5000 BP. This warmer and drier Hypsithermal interval was witnessed in the mid-latitudes of the Southeast west of the Appalachians as well. Forest communities in Tennessee became xeric during this interval (Delcourt 1979). A warm and wet climate was evidenced in the southern Appalachian Mountains and Gulf Coastal Plain. Coastal Plain taxa favoring wetland environments inhabited sag ponds in the Ridge and Valley of central Alabama (Delcourt et al. 1983) and northwestern Georgia (Watts 1970). By 6500 BP, pollen evidence indicates that Coastal Plain species had migrated to Cades Cove, east Tennessee during a warm and wet interval. The diversity of species within the Great Smoky Mountains regions reflects the mingling of elements of alpine tundra, boreal forest, deciduous forest, and evergreen forest, and the location of relict habitats of these species during the Quaternary.

The dominant species of the Southern Evergreen Forest shifted during the middle Holocene. By 5000 BP, forest once dominataed by xeric oak and hickory species were replaced by southern pine species (Delcourt 1980; Watts 1969, 1975a; Watts and Stuiver 1980; M. Davis 1983). Even in Tennessee, where pine was never abundant, pine pollen frequencies increase (M. Davis 1983: 179). Delcourt and Delcourt (1985) attribute this shift to pine as a result of the strengthening of the Tropical Airmass, intensification of hurricane frequency, and an increase in fire frequency. The Southeastern Evergreen Forest remained intact on the upland interflueves of the Gulf Coastal Plain during the transition between the last glacial/intergalcial cycle. Changes in the forest composition reflect changes in effective precipitation and fire frequency during this interval.

During the Late Holocene Interval (4000 BP to the present), spruce and fir expanded locally at mid- and high elevations in the central and southern Appalachian Mountains as a result of minor cooling conditions (Barclay 1957; Watts 1979; Shafer 1984; Delcourt and Delcourt 1984a, 1985; Delcourt 1985; M. Davis 1983). Davis (1983) attributes this boreal expansion to a cooling episode as well, although she notes the time of this occurrence varies between 5000 and 1000 BP depending on the particular section of the Southeast examined. Meanwhile, American chestnut (Castanea dentata) expanded northward and increased in abundance in the southern and central Appalachians (Delcourt and Delcourt 1981). Today, extensive Appalachian oak-chestnut forest are the result. Also in the late Holocene, shortleaf pine (Pinus echinata) migrated northward and expanded its range into the Ozarks of Missouri and eastern Oklahoma (Albert and Wykoff 1981; Smith 1984). Pocosin wetlands filled in the Carolina Bays along the Atlantic coastal plain (Whitehead 1965, 1973, 1981), and coastal swamps expanded (Spackman et al. 1966; Whitehead and Oaks 1979; Cohen et al. 1984).

The impact of the American Indian on native vegetation has also been noted in late Holocene pollen records from the Southeast. Occasional pollen representing cultigens has been recovered. Large Low-spine Compositae frequencies, Cheno-am, Portulacaceae, Plantago spp. and Rumex indicated that areas of disturbed ground occurred at Tuskegee Pond, and reflected expanses of open landscape on terraces adjacent the Little Tennessee River.

Forest trees which are widespread throughout the Southern Forest zone and occur frequently as dominants or subdominants include oak (Quercus) and hickory (Carya). These trees include numerous species that occupy a diverse range of moisture and topographic gradients, displaying adaptation to a wide range of ecological conditions.

The Lower Mississippi River Valley abounds with large, permanent oxbow lakes which were formed when river meanders were cut off. Sediments in these oxbow lakes is frequently the best source for examining the Holocene pollen record (Delcourt and Delcourt 1985). Big Lake, which was cored for pollen and geomorphic analyses, represents the Right Hand Chute of the Little River. The sediment cored appears to represent braided stream facies in the lower portion, followed by channel fill and Little River alluvium. Pemiscot Bayou represents a meander channel fill exhibiting several cycles. Cores were extracted from both locations for palynological examination to obtain data pertaining to the paleoenvironment.

Data Discussion

To facilitate the description and interpretation of the pollen diagrams from the two pollen cores from Pemiscot Bayou and Big Lake, the diagrams are divided into several pollen zones, each of which is considered to have some degree of internal uniformity in relation to vegetation or climatic perameters controlling that vegetation. The pollen diagrams from both Big Lake and Pemiscot Bayou may be divided into four pollen zones each, which are labeled, solely for convenience, as A, B, C and D. The zones were not selected for resemblance to zones from any other palynological study, although the two diagrams were compared to one another in selecting the zone locations. The Pemiscot Bayou diagram will be discussed first, followed by a discussion of the pollen zones from Big Lake.

The category "Juniperus/Taxodium" pollen encompasses both genera, since broken and crushed Taxodium pollen cannot be distinguished from Juniperus pollen. No clear exit papilla (Kapp 1969) were observed on any of the grains, although cypress is recorded in the present vegetation at Big Lake, and was recovered in small quantities in other samples analyzed by James King from the past 180 years at Big Lake (King 1980). He, also, notes that Taxodium may be present in his Juniperus pollen category due to the similarity of the pollen grains morphologically, and the fact that many grains were broken and crushed. Many of the pollen grains from both Big Lake and Pemiscot Bayou were crushed and broken, and in a relatively poor state of preservation.

A nearly basal date of 8530 ± 300 was obtained from a depth of 14.5 to 17 feet (Beta 17030) in the Pemiscot Bayou core, which had a total depth of 19 feet (Table 18). This was the lowest level of the core to contain a sufficient organic content to provide a radiocarbon age. At Pemiscot Bayou, this lowest zone (Zone A) extends from the base of the core to a depth of approximately 13 feet (samples 20-17). Zone A is typified by moderate frequencies of Quercus pollen, small quantities of other tree pollen, including Corylaceae, Carya, Juniperus/Taxodium, Liquidambar, Pinus, Salix, and Ulmus (Figure 31, Table 19). The non-arboreal component of this zone is dominated by Low-spine Compositae, and the Cheno-am pollen is noted as being sub-dominant. Much smaller quantities of Artemisia, High-spine Compositae, Cyperaceae, Ephedra, Gramineae, Liliaceae, and Rosaceae pollen were recovered. Isolated microspores belonging to Isoetes were recovered from this level, indicating the presence of standing or slow-moving water. Various spores, several of which may have been derived from ferns, were also observed in these samples. The character of the pollen record at this level, which encompasses the radiocarbon age 8530 BP, indicates a mixture of bottomland forest, weedy open ground, and at least some open-water swamp communities.

Isoetes (quillwort) is an aquatic plant that produces both microspores (male) and megaspores (female) in alternating cycles. The megaspores may range from 280 to 650 microns in diameter. A 150 micron mesh was used to screen the larger organic fraction during the extraction process to remove sands and large organic particles. Therefore, no megaspores were expected in the pollen samples, although microspores were quite numerous in some samples. Isoetes may grow in depressions, on wet shores, in shallow water, in fresh ponds, in slightly brackish water, or in streams (Fernald 1950:16-19).

The pollen evidence from Zone A indicates that by 8500 BP and probably earlier, as at least one sample predates that age, many of the bottomland arboreal species were growing in this portion of the Mississippi River Valley. Oak (Quercus) was well established, and both hickory (Carya) and the hazel family (Corylaceae), as well as willow, were regular components of the landscape. Pine and juniper are noted in the pollen record, and probably occupied drier slopes. Cypress may be included in the juniper counts, and may also be present by this time. Very small quantities of both sweet gum (Liquidambar) and elm (Ulmus) are noted early in the record, establishing their presence in the area by 8500 BP.

Zone A is followed by Zone B (samples 16-10), which contains evidence of numerous changes in the pollen record. Quercus has increased its dominance in the Southern Forest, and many of the arboreal species have also increased their numbers. Most noteable are the increases in Carya, Juniperus/Taxodium and Pinus pollen. Both juniper and pine may be associated with increasingly dry conditions. King and Allen (1977) note that the increase in pine and juniper pollen suggests that the Ozarks were undergoing

TABLE 18
PROVENIENCE OF POLLEN SAMPLES FROM PEMISCOT BAYOU

Sample No.	Approx Depth in cm below core top	Core Unit (ft)	Munsell Soil Color	Hori-zon	Soil Description (Grain Size)	Pollen Counted
1	4	0.0–0.5	10YR3/1-2	Ap	Clay, silty medium sand	200
2	65	2.0–2.5	10YR5/2 to 4/2	Cg2	Medium to fine sand, little silt, iron stains	100
3	95	3.0–4.5	10YR4/2	2Cg	Silt with little clay, very fine sand	200
4	138	4.5–5.0	10YR4/1	3Ab1	Clayey silt	200
5	159	5.0–5.5	10YR2/1	3Ab2	Silty clay	100
6	169	5.5–6.0	10YR4/2	3Cg	Silty clay, iron stains	100
7	185	6.0–6.5	10YR3/1	4Ab	Silty clay	200
8	207	6.5–7.0	10YR5/2 to 5/1	4Cg1	Silty clay, sand lenses, magnesium nodules	100
9	239	7.5–8.5	10YR5/2 to 5/1	4Cg1	Silty clay, sand lenses, magnesium nodules, iron stains	200
10	277	9.0–9.5	10YR5/2	4Cg2	Medium sand, magnesium and iron stains	100
11	286	9.0–9.5	10YR6/2	4Cg3	Silty clay, iron and magnesium stains	100
12	312	10.0–10.5	10YR6/2	4Cg3	Silty clay, magnesium and iron stains	200
13	328	10.5–11.0	10YR6/2	4C	Medium sand within silt, magnesium and iron stains	200
14	342	11.0–11.5	10YR5/1	4Cg4	Silty clay with some medium coarse sand, some iron and few magnesium stains	100
15	348	11.0–11.5	10YR5/1	4Cg4	Silty clay with some medium coarse sand, some iron and few magnesium stains	100
16	370	12.0–12.5	10YR4/2	5Ab	Sandy clay loam	100
17	415	13.5–14	10YR6/1	5Cg	Silty clay with coarse sand, magnesium nodules	100
18	457	15.0–15.5	10YR6/1	6Ab.	Silty clay with coarse sand, magnesium nodules, oxidization banding	100
19	495	16.0–16.5	10YR5/1	6Cg1	Silty clay with little sand, bedded, sand and gravel lenses, mottled	100
20	582	18.5–19.0	10YR5/1	6Cg1	Silty clay with little medium sand, mottled	100

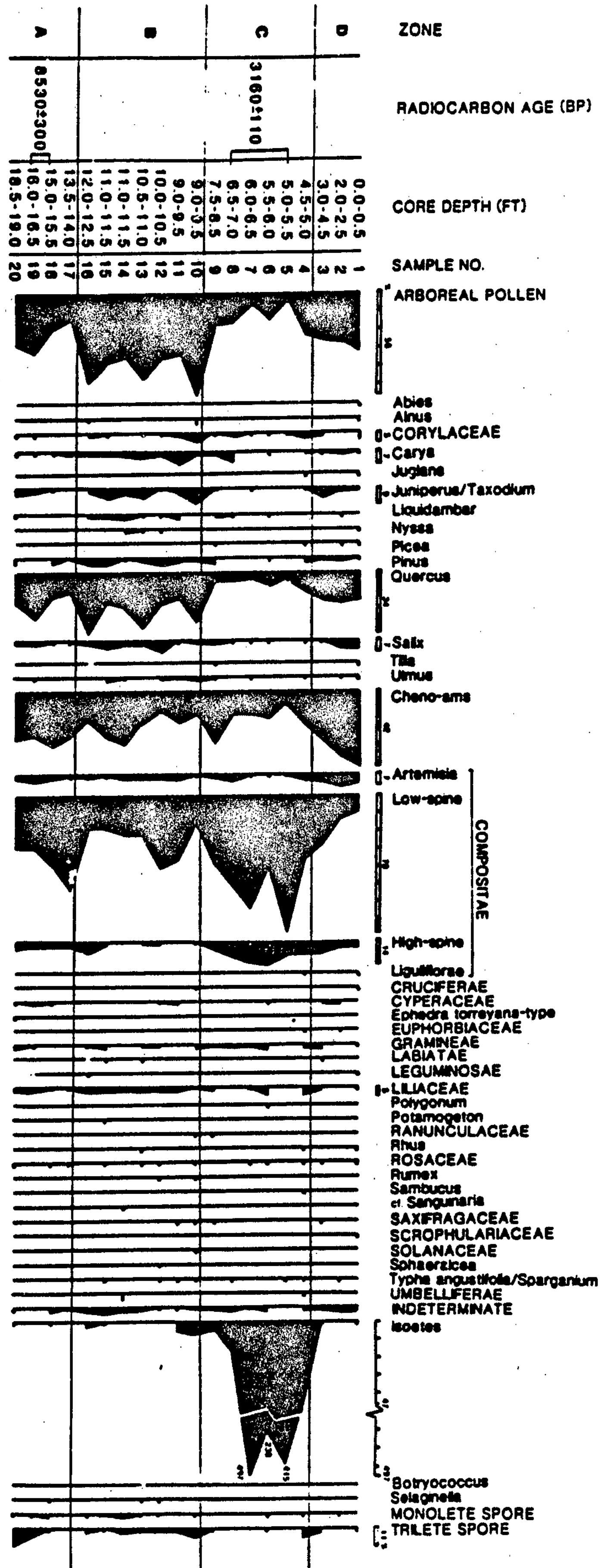


FIGURE 31. POLLEN DIAGRAM FROM PEMISCOT BAYOU, ARKANSAS.

TABLE 19
POLLEN TYPES OBSERVED AT BIG LAKE AND PEMISCOT BAYOU

Scientific Name	Common Name
ARBOREAL POLLEN:	
Abies	Fir
Alnus	Alder
Corylaceae	Hazel family
Carya	Hickory
Juglans	Walnut
Juniperus	Juniper
Taxodium	Cypress
Liquidambar	Sweet gum
Nyssa	Black gum, tupelo gum
Picea	Spruce
Pinus	Pine
Quercus	Oak
Salix	Willow
Tilia	Basswood
Ulmus	Elm
NON-ARBOREAL POLLEN:	
Cheno-ams	Includes amaranth and pigweed family
Compositae:	Sunflower family
Artemisia	Sagebrush, wormwood
Low-spine	Includes ragweed, marsh-elder, cocklebur, etc.
High-spine	Includes aster, sunflower, etc.
Liguliflorae	Includes dandelion and chickory
Cruciferae	Mustard family
Cyperaceae	Sedge family
Eleagnaceae	Russian olive family
Ephedra	Mormon tea
Euphorbiaceae	Spurge family
Gramineae	Grass family
Haloragaceae	Water-milfoil family
Labiatae	Mint family
Leguminosae	Pea family
Liliaceae	Lily family
Polygonum	Smartweed
Potamogeton	Pondweed
Ranunculaceae	Buttercup family
Rhamnaceae	Buckthorn family
Rhus	Poison ivy, Sumac
Rosaceae	Rose family
Rumex	Dock
Sambucus	Elderberry
Sanguiraria	Bloodwort
Saxifragaceae	Saxifrage family
Scrophulariaceae	Figwort family

TABLE 19 (Continued)

Scientific Name	Common Name
Solanaceae	Potato/tomato family
Sphaeralcea	Globe mallow
Typha/_Sparganium_	Cattail/Bur-reed
Umbelliferae	Parsley/carrot family
Viola	Violet
Isoetes	Quillwort

drought-related vegetational changes. Zone B does not appear to be markedly drier than Zone A in the Pemiscot Bayou pollen record, as increases in Salix (willow) pollen are noted, as is the presence of pollen from Potamogeton and Typha/Sparganium, both of which represent plants which grow in wet habitats. In addition, Isoetes microspores were recovered from the base and top of this zone. The pollen record for Zone B indicates that the local environment was considerably more forested than it had been previously or is at present. This zone contains evidence that the bottomland forest habitat had expanded considerably. Although no radiocarbon age was obtained from sediments within this zone at Pemiscot Bayou, the zone may be compared to Zone B at Big Lake, which had as its lower sample, a sample which was part of a unit which reported a radiocarbon age of 6450 BP. This suggests that Zone B at Pemiscot Bayou extended from approximately 6500 or 7000 BP to approximately 4000 or 3500 BP. The ending dates for this zone are extrapolated from ages obtained for sediments within Zone C at both Big Lake and Pemiscot Bayou.

Zone C (samples 9-4) at Pemiscot Bayou is characterized by a dramatic decrease in Quercus pollen, as well as a reduction in most of the bottomland arboreal pollen types. There was a corresponding increase in the Low-spine and High-spine Compositae pollen in this zone. This zone also records a dominance by Isoetes microspores. These microspores were not included in the pollen count, but their frequency was calculated by the same method as the pollen frequencies. The central portion of Zone C, which contained the largest frequencies of Low-spine Compositae pollen, was dominated by Isoetes microspores. They occurred approximately two to five times as frequently as all of the pollen types combined.

The morphologic group of Low-spine Compositae pollen includes primarily the following four pollen types: Ambrosia, Franseria, Iva, and Xanthium. These four genera all thrive in waste places or disturbed areas. Iva (marsh-elder or highwater-shrub) is noted to grow in saline marshes and alluvial or moist soils, while Xanthium (cocklebur) grows in bottomlands and low grounds, and on shores and waste places. The association of Isoetes microspores, which represent a plant that thrives in open water, and Low-spine Compositae, which includes at least 2 genera which grow in moist ground or at the edge of streams, suggests that Zone C was one which experienced an increase in moisture, or a raising of the water table, which inundated much of the bottomland that formerly supported the bottomland arboreal trees. A radiocarbon age of 3160 ± 110 is reported for a depth of 5 to 7 feet at Pemiscot Bayou (Beta 17029). This encompasses the central, most moist, portion of the pollen record.

Zone D (samples 3-1) represents the most recent deposits at Pemiscot Bayou. This zone contains evidence of an increase in the Quercus (oak) population, as well as a general increase in arboreal (tree) species. This indicates an expansion of the bottomland arboreal habitat post 3000 BP, and probably much more recently. An increase in Cheno-am pollen is recorded in this zone, and may indicate an increase in the disturbance of the ground, or that members of this group of plants are the most abundant of the plants colonizing the unforested areas. The Low-spine Compositae pollen decreases throughout this zone, suggesting a continued drying of the area following the extremely wet episode recorded in Zone B. The upper portion of the pollen record at Pemiscot Bayou is truncated and provides no evidence of short-lived changes that may have occurred in the vegetation during the past 2000 to 3000 years.

Big Lake was cored to a total depth of 19 feet. The lower portion of the pollen column (20-22.5 feet) yielded a radiocarbon age of 9050 ± 150 BP (Beta 17028) (Table 20). The lowest three samples (samples 15-13) from the Big Lake core represent the lowest zone, Zone A. Sample 12, the uppermost sample of this zone, was combined with sample 11 to yield a radiocarbon age of 6450 ± 200 BP at a depth of 16 to 18.5 feet (Beta 17027). This provides a date range for Zone A at Big Lake of approximately 9000 to 6500 BP. This zone exhibits rather high frequencies of _Quercus_ and _Carya_ pollen, indicating a well-developed bottomland arboreal community (Figure 32, Table 19). In addition, the _Liquidambar_ population appears to be significant in this area. Small quantities of _Juniperus_/_Taxodium_ and _Pinus_ pollen were also recovered in this zone. The non-arboreal component of this zone is relatively small, and includes primarily Cheno-ams and Low-spine Compositae. Small quantities of Gramineae (grasses) and Liliaceae (lily family) were also recovered regularly. The presence of _Typha_/_Sparganium_ pollen indicates the presence of open water or moist ground in the vicinity during this zone. _Isoetes_ microspores were also recovered at the base of the pollen record indicating the presence of open water or moist ground.

Zone B is represented by only three pollen samples--two at the beginning of the zone and another at the end (samples 12-9). An increase in _Quercus_ pollen is recorded at the beginning of the zone, but a decline follows. In contrast, _Liquidambar_ increases throughout the lower portion of the zone. _Carya_ decreases and is not as important an element of the bottomlands arboreal community, although it it still present in significant numbers. Relatively small quantities of non-arhoreal pollen are recorded. The end of this zone exhibits a moderately high frequency of _Quercus_ pollen. Fluctuating _Quercus_ pollen frequencies are noted throughout Zone B at Pemiscot Bayou, suggesting that the same phenomenon is at work in the Big Lake record, but appears differently due to a truncation of the pollen record in this zone. _Isoetes_ microspores are observed in the pollen record at Big Lake in larger frequencies than at Pemiscot Bayou, suggesting that Big Lake supported open water during this interval which is characterized at Pemiscot Bayou as being dominanted by bottomland arboreal species. The base of Zone B is defined by a radiocarbon age in samples 11 and 12 combined (6450 ± 200BP), whereas the top of the zone is defined by a radiocarbon age of 3500 ± 150 BP in the sample above the top of the zone.

Zone C (samples 8-7) yielded a radiocarbon age of 3500 ± 150

BP in sample 7 at a depth of 9-11 feet (Beta 17026). This zone corresponds directly with Zone C at Pemiscot Bayou. It exhibits a dramatic increase in Low-spine Compositae pollen, as well as Isoetes microspores. Decreases are registered in all arboreal pollen types, and is very noticeable in the Quercus pollen. The bottomland arboreal habitat appears to have been constricted from at least 3500 BP until after 3000 BP. The area of open water and swampland appears to have increased significantly during this period. The large quantity of Low-spine Compositae pollen observed in samples 7 and 8 at Big Lake and samples 5 through 7 at Pemiscot Bayou were predominantly a type that was not observed in large frequency in any of the other samples. This change indicates that there was a change in species, if not genus, of Low-spine Compositae during the wet interval of Zone C at both Big Lake and Pemiscot Bayou. The pollen was in a poor state of preservation at both locations, so identification to genus was not possible

Zone D (samples 6-1) represents a period of time post-3000 BP, and perhaps more recent. The depth of this zone compared to Zone D at Pemiscot Bayou indicates that large quantities of sediment have accumulated at Big Lake in the recent past. Therefore, the resolution of paleoenvironmental conditions over this period is considerably better at Big Lake than at Pemiscot Bayou. Both the Low-spine Compositae and Isoetes populations decline towards the beginning of Zone D, and Quercus and Carya pollen increase, indicating an increase in the size of the bottomland arboreal habitat and drying of the wet areas, compared to approximately 3500-3000 BP. There is also an increase in the Juniperus/Taxodium and Pinus pollen frequencies, suggesting a drying episode, which reverses itself toward the top of the zone, where Salix and Low-spine Compositae pollen both increase. Typha pollen is noted occasionally throughout Zone D, indicating the presence of open water in the vicinity.

TABLE 20
PROVENIENCE OF POLLEN SAMPLES FROM BIG LAKE

Sample No.	Approx Depth in cm below core top	Core Unit (ft)	Munsell Soil Color	Hori-zon	Soil Description (Grain Size)	Pollen Counted
1	1.3	0-1.5	10YR4/2	Bw	Clayey silt with fine sand	200
2	69	2.0-2.5	10YR4/1	Cg	Silt with very fine sand	200
3	94	3.0-3.5	10YR4/1	Cg	Clayey silt	200
4	124	4.0-4.5	10YR4/1	2A	Clayey silt	200
5	170	5.0-5.5	10YR4/1	2Cg	Silt with clay and fine sand	100
6	226	7.0-7.5	10YR5/1	2Cg	Silt with clay and fine send	200
7	257	8.0-8.5	10YR4/2	3Cg1	Sandy clay loam, fine sand, oxidation noted	100
8	297	9.5-10.0	10YR5/1	3Cg2	Silty fine sand, magnesium nodules, oxidation increases	100
9	353	11.5-12.0	5Y5/1	3Cg3	Sandy clay loam, bedded	100
10	404	13.0-13.5	5Y5/1	3Cg3	Sandy clay loam, bedded	Insuff
11	419	13.5-14.0	5Y5/1	3Cg3	Sandy clay loam, bedded	100
12	490	16.0-16.5	5Y4/1	4Cg	Silty clay, mottled, iron and magnesium nodules	100
13	556	18.0-18.5	5Y4/1	4Cg	Silty clay, mottled, iron and magnesium nodules	100
14	617	20.0-20.5	5Y4/1	4Cg	Silty clay, mottled, iron and magnesium nodules	100
15	676	22.0-22.5	5Y4/1	4Cg	Clayey silt lens within silty clay unit	200

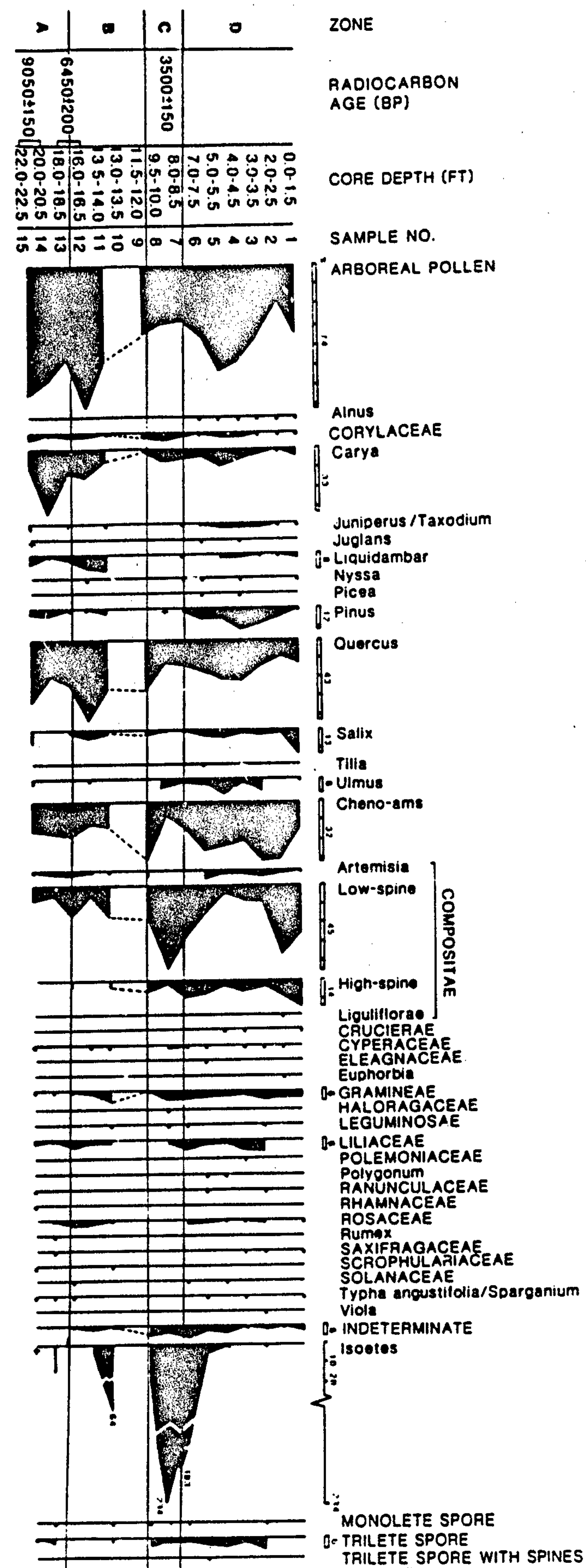


FIGURE 32. POLLEN DIAGRAM FROM BIG LAKE, ARKANSAS.

SUMMARY AND CONCLUSIONS

Palynological analysis of two cores from Pemiscot Bayou and Big Lake in northeastern Arkansas has focused on paleoenvironmental reconstruction for this area during most of the Holocene. Records for the past approximately 9000 years were obtained from both cores, although certain intervals were represented better in one core than another. The Pemiscot Bayou core contained the best record from approximately 9000 BP to post-3160 BP. The Big Lake core, on the other hand, contained the longest record post-3500 BP. The two pollen records are complimentary and exhibit many of the same landmarks, although local response to paleoenvironmental change was not identical.

Comparison of the Pemiscot Bayou and Big Lake pollen records with regional paleoenvironmental interpretations places these records within perspective. No evidence of an interval dominated by pine, fir, and spruce pollen was recovered from the base of either core. Instead, both pollen records demonstrate the presence of oak (Quercus) and hickory (Carya) pollen in Zone A, which agrees with the defined regional vegetation typical of the Early Holocene (12,500-8500 BP) (Delcourt and Delcourt 1985). The Early Holocene oak and hickory forests are more well developed at Big Lake than at Pemiscot Bayou, which displays a dominance of oak pollen, suggesting an oak forest mixed with herbaceous communities, which appear to have been primarily Cheno-ams and Low-spine Compositae. The presence of ponded or moving water is noted in the Isoetes and Typha/Sparganium frequencies.

The Middle Holocene regional vegetation notes an increase in sweet gum (Liquidambar) pollen. Such an increase is observed at Big Lake near the end of the Early Holocene and into the early portion of the Middle Holocene, and at Pemiscot Bayou throughout the Middle Holocene (Zone B). The increase in sweet gum occurs in response to drying conditions. Both oak (Quercus) and pine (Pinus) pollen are also noted to increase under these conditions and are noted to increase regionally during the Middle Holocene (Delcourt and Delcourt 1985). Expansion of the oak and pine populations are noted especially in the core from Pemiscot Bayou, which contains the longest record from the Middle Holocene interval. This interval records the expansion of the bottomland arboreal habitat and upland forested habitats and contraction of swampy areas, probably in response to lowering of the water table and/or drying conditions. This change appears to have lasted several thousand years (6500-4000 or 3500 BP) at Pemiscot Bayou and Big Lake. Drier conditions are also recorded at Old Field in southeastern Missouri between 8700 and 5000 BP, when the grassland expands at the expense of the bottomland community. This indicates that the Prairie Peninsula moved closer to Pemiscot Bayou and Big Lake during this period of warmer, drier conditions. These conditions appear to have persisted approximately 1000 years longer at Pemiscot Bayou and Big Lake than they did at Old Field, where a gradual cooling was accompanied by more moist conditions.

Zone C marks the beginning of the Late Holocene (4000 BP) at Pemiscot Bayou and Big Lake. Unlike the Old Field record, these two cores display a relatively abrupt change to wet, swampy conditions. The bottomland arboreal habitat is severely restricted during this interval, and the vegetation appears to be dominated by plants adapted to wet, swampy conditions, including a Low-spine Compositae and _Isoetes_. This interval of wet, swampy conditions appears to be relatively short-lived, as the Low-spine Compositae and _Isoetes_ decline rapidly after 3000 BP at both Pemiscot Bayou and Big Lake. Spackman _et al_. note that coastal swamps expanded during the Late Holocene, which may correlate with the increase in swampy habitat in these records from approximately 4000 or 3500 BP to post-3000 BP.

The end of the Late Holocene is marked by a return to conditions favoring the establishment of bottomland forests dominated by oak in Zone D at both Pemiscot Bayou and Big Lake. Cypress is included in the _Juniperus_/_Taxodium_ frequencies, and cannot be separated from juniper. Pines increased during the Late Holocene at Big Lake, but declined below the surface. Spruce is noted to expand elsewhere during the Late Holocene (Delcourt and Delcourt 1985), and is noted sporadically throughout the Late Holocene pollen records at both Pemiscot Bayou and Big Lake in Zones C and D, suggesting long distance transport. The cooling trend reported elsewhere is not specifically observed in these records. The resolution obtained in King's (1980) study of Big Lake for the past 180 years cannot be duplicated in this pollen record from Big Lake due to sampling constraints and compaction of the core. Therefore, changes recorded in King's study are not evident in the single sample that may approximate his study in age at the top of the pollen column.

Paleoenvironmental interpretations gleaned from the pollen record at Pemiscot Bayou and Big Lake indicate that the local vegetation regime has fluctuated between one dominated by bottomland arboreal habitat and supporting smaller swampy herbaceous communities, to being dominated by swampy communities, thus reducing the bottomland forests. The composition of the bottomland arboreal habitat has varied from interval to interval, although diverse vegetation is recorded for both the Middle Holocene (Zone B) at Pemiscot Bayou and the end of the Late Holocene (Zone D) at Big Lake. A single episode of inundation was recorded between approximately 4000 or 3500 BP and post-3000 BP at both locations. The vegetation patterns displayed at both Pemiscot Bayou and Big Lake conformed to the general regional patterns, although local variations were observed.

CHAPTER 8

SITE SIGNIFICANCE

by

Robert H. Lafferty III

INTRODUCTION

In this chapter the significance of the cultural resources discovered in the Ditch 29 survey area is assessed in terms of the National Register of Historic Places (NRHP) criteria. Significance in terms of these criteria has developed over the past century and is legally embedded in the laws and regulations of the Federal Government (Federal Register 1976, 1977a). The development of this concept has been extensively discussed (cf. extensive summary in Lafferty et al. 1984:133-137) and will not be recapitulated here. Below I briefly define these criteria as currently used. The temporal span of the resource base is then discussed. Pertinent research questions are specified from the State Plan (Davis 1982) for the sites that have NRHP quality deposits, and the eligibility of each site group is discussed. Finally, the impact to each potentially significant site is summarized. Many of the details of the contents and nature of each site is presented in Appendix B.

SITE SIGNIFICANCE

Federal Regulation 36CFR60.4 outlines the qualities that make cultural properties significant and eligible for nomination to the National Register of Historic Places (NRHP). These regulations state:

National Register criteria for evaluation.

> The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history (Federal Register 1976:1595).

In order for sites to be significant and eligible for NRHP nomination they should have intact deposits and a high degree of integrity of location, setting, feeling and association. While these are not criteria for significance, they comprise a general precondition defined in the regulations (Federal Register 1976:1595). In some instances it can be waived if intact deposits of a particular study unit (cf. Davis 1982 and Morse 1982a for the specific ones currently recognized in this part of Arkansas) are not known or are known to be almost nonexistent. For example, in the Ozarks Sabo et al. (1982) explicitly included disturbed assemblages from the Archaic, Mississippian and Woodland periods and virtually any Paleo-Indian/Dalton site as potentially significant, which suggests just how rare these undisturbed sites are in that region. Other highly disturbed sites which are known to be representative of classes of sites with known undisturbed deposits are likely to be non-significant; however, specific arguments might also waive this.

The temporal cut off for significance is legally set at more than 50 years old. Again this requirement can be waived if the resource is associated with someone of note or importance, and is otherwise eligible under Criteria a, b or c.

For a site to be archeologically significant (Criterion d) it must be shown to have data relevant to current research questions in an archeological region such as the Central Mississippi River Valley (cf. Tainter and Lucas 1983 for comment and extensive reference of this discussion). At the present time, some of the basic study units which form the basic cultural, chronological and spatial units that are manipulated in more sophisticated processual analysis have not been defined. Therefore, chronology construction and assemblage/phase definition are all high priority activities and form relevant research questions.

In the individual discussions of areas of significance (below) I discuss several imnortant questions that are addressable with the Ditch 29 data base. A summary of these sites is presented in Table 21. The discussion under the major headings of historic and prehistoric sites is structured first to place the sites temporally and structurally and second to eliminate the sites that are not significant in terms of one or more of these criteria. Finally, the areas of significance (for the sites thought eligible for NRHP nomination) and the project impact to these are discussed.

Table 21. Cultural Resources Data Base Ditch 29 Project

Site # 3MS:	Period	Type	Intact Deposits	Features	Impact
21	W,M,H	Occupation	Yes	M,P,S	No
119	W,M,H	Occupation	Yes	P,S	NO
199	W,M,H	Occupation	Yes	P,S	No
471	W,M,H	Occupation	Yes	P?,S	No
472	H	Domestic	No	No	No
473	W,M,H	Occupation	No ?	No	No
474	H	Domestic	No	No	No
475	W	Domestic ?	?	?	No
476	W	Domestic ?	?	?	No
477	W	Domestic ?	?	?	No
478	H	Domestic	No	No	No

KEY W = Woodland M = Mississippian H = Historic
M = Mound S = Stratigraphy P = Pits

HISTORIC COMPONENTS

The dating of historic sites is based on the interpreted archival data (Appendix B) and the artifact assemblages recovered in the project. The interpretation of occupation based on artifacts with known manufacture periods is not at all straightforward but follows a logic similar to that used in stratigraphic interpretation and the law of superposition. If, for example, we know that a particular artifact was manufactured after 1904 and we have found it on the site, we know that the site was occupied after this date. This is known technically as the _terminus post quem_ (Noel-Hume 1970:69). From this we do not know the beginning date of occupation, nor do we know how long after 1904 the site was occupied. If we are concerned with plowzone deposits, this is still an active deposit with modern material being actively incorporated into the matrix. This deposit does not yet have a terminus ante quem - the date before which a deposit must have terminated.

Table 22 presents the distributions of temporally sensitive artifacts recovered from all of the historic components found in the Ditch 29 survey. The dates of manufacture of the different types are presented to the left of the counts per site.

Table 22. Summary of temporally diagnostic historic artifacts

Artifacts	Sites (All prefixed by 3MS:)							
	21	119	199	471	472	473	474	478
Ceramics								
Whiteware (1840-P)	1	70	51	21	38	14	55	57
Transfer Blue (1840-1930)							3	
Decalcomania (1860-P)		1	1	2		1	3	2
Stoneware (~1870-1930+)		40		13	6	13	1	1
Glass								
Bottles								
seam: shoulder (1810-1880)								
3/4 up neck (1810-1913+)								
Through lip (1904-P)		1		1		1	1	
Crown cap (1892-P)								
Hand-made marble ((1904)					1			
Machine-made marble (1904-P)			1					
Canning Jars								
Threaded (1904-P)			10	1	6	6	7	7
Milk glass lids (1840-~1940)		10			11	1	9	10
Tractor parts (~1930-P)								
Electrical parts (~1930-P)						4	4	
Aluminum (~1950-P)			1				5	
Wire Nails (1890-P)					1	7	13	2
Plastic (~1950-P)		3	4		3	2	23	4
Coins (Date 1905)	45							

The eight historic assemblages recovered are largely from the twentieth century with a few artifacts indicating possible occupation in the nineteenth century. The finish on bottle necks and jar rims are particularly useful in defining this separation. In 1904 the Owens-Corning bottle machine came onto the production line making it possible to totally automate the manufacture of these and to make cheap threaded jars. The mold seam lines are particularly diagnostic of this machine, with the seam going all of the way through the lip of the artifact (Plate 9N,9O). Prior to this the lips had to be hand finished. No bottles of this type were found. Crown cap closures were invented in 1892 and went over to machine finishing in 1904. The crown cap recovered from 3MS474 was machine finished (Plate 9N). In interpreting all of these developments one must bear in mind that the bringing on line of a process took some time and that all bottles were not necessarily hand finished. Indeed, large water bottles are still hand finished and certain other bottles, especially medicine bottles, continued to be hand finished into the 1920s.

The production of cheap glass bottles and jars with threaded closures (Plate 9H, 9I) also greatly lowered their cost, making them more competitive with the stoneware jugs and crocks, which had been important storage containers. These became less important for food storage over the next half century; however, while many of these types are still manufactured, their use has been reduced greatly from their use in the late 19th century. The 87 sherds recovered in the Ditch 29 survey is a low density compared to other sites in the eastern Tyronza Basin (Lafferty et al. 1984) but similar to proportional densities found in the later settled Tyronza sunklands (Lafferty et al. 1985a).

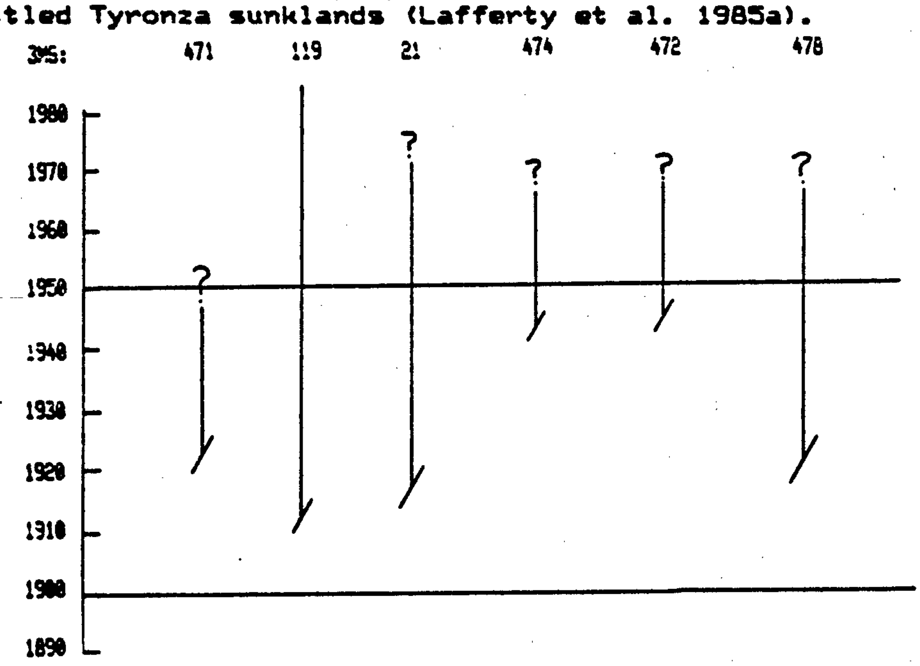


Figure 33. Temporal span of historic components

The analysis of the historic artifacts and the archival data indicates that all of the sites date from the early twentieth century to the middle of the twentieth century (Figure 33). The preponderance of evidence indicates that most were occupied <u>terminus ante quiem</u> after 1920. These fall into two activity periods (Stewart-Abernathy and Watkins 1982:H43) defined in the State Plan: Maximum Occupation, and Automobile.

Two of the sites' historic components are dumps (3MS473, 3MS199) and the remainder of these sites (N=6) are domestic house sites. These two components date from the 1940s to 1950s and are too recent for nomination to the National Register of Historic Places.

The other six of the sites and historic components are historic domestic sites from the Automobile activity period (3MS:21, 119, 471, 472, 474, and 478). The documentary evidence is that these were first occupied in the 1920s to 1940s and were the homes of the sturdy yeoman farmers who bought the cleared land from the lumber companies after they had harvested the virgin hardwood forests of Buffalo Island. All of these sites are too recent to be considered eligible for nomination to the National Register of Historic places. None of these sites is directly associated with any person of note or importance.

No further archeological work is recommended at any of the historic sites located in the Ditch 29 survey. In contrast with the Phase I Tyronza survey area, this area was opened late after the railroad made possible the efficient exploitation of the native vegetation. This is a similar history of land reclamation in the Phase II Tyronza area in the Tyronza Sunklands, where the sites are very recent. The difference between these two areas is that the Wilsons retained control of the land after it was cleared while on Buffalo Island the northern corporations sold the land in 40 acre plots, which are only now being consolidated into large holdings. In the Tyronza Sunklands, many of the historic sites were tenant houses, while on Buffalo Island they were occupied by yeoman farmers. Comparative cost analysis of these collections (Tyronza and Buffalo Island) could indicate real economic position of these two classes.

The changes being wrought in the consolidation of these farm holdings are rapidly changing the nature of the cultural landscape of Buffalo Island. While in the field we had 1983 and 1985 quadrangles. I estimate that at least 50% of the houses shown in those years had since disappeared. Almost half of those still standing are currently vacant. With this demographic collapse in the rural landscape we can expect a concomitant decrease in the populations of the minor centers which still exist --Leechville, Monette and Manila. The first order centers are already gone or the stores and schools standing abandoned.

PREHISTORIC SITES

Eight sites had prehistoric components: 3MS21, 3MS119, 3MS199, 3MS471, 3MS473, 3MS475, 3MS476, and 3MS477. These sites are in different situations and are discussed in three groupings below: definitely significant, possibly significant and probably significant.

Four sites are definitely significant in terms of the NRHP criteria: 3MS21, 3MS119, 3MS199 and 3MS471. These four sites are cut by the seep ditch and were on the edge of a natural levee of the Little River and Big Lake Swamp. All four of these sites have stratified deposits which span the Woodland and go into the Mississippian. The presence of sand and shell tempered ceramics on 3MS21 and 3MS119 could be very important and crucial to understanding the transition to Mississippian. The test units excavated in all four sites produced large rim sherds (Plates 5-8) which were often very well preserved. Carbon was recovered from all four sites, and some of this is in very high densities. The presence of Poverty Point Objects in the bottom of two of these sites (Plate 8) strongly indicates that there are Early Woodland components present. One sand-tempered bead was recovered from 3MS21 (Plate 8), and all produced lithics, including Mill Creek hoe flakes, a Dover hoe (Plate 6), a poll end of a basalt celt or adze (Plate 7) and points. In addition four of the test units had features. Considering the low percentage of the site area excavated this very strongly indicates that there are many features present. There are also burials documented from one of these sites. If these are from the Mississippian and Woodland periods, this is an important data base for studying the possible continuity and discontinuity between these periods and in complement with the Zebree site. One of these sites (3MS119) has produced points spanning the Archaic period. The implication of this and of the radiocarbon dates from Big Lake Swamp are that these levees probably have components laced all through them. These sites contain data that could be used to define the range of variation of the Woodland in this part of the world and probably the Archaic period. This data base could also be used to reconstruct prehistoric diet through much of this time span. To my knowledge equivalent stratified deposits have not been found elsewhere in the Little River levee system. These sites are clearly significant in terms of the NRHP criteria.

Three other sites (3MS475, 3MS476, and 3MS477) are also located on this levee. All three produced small fragments of Barnes pottery in a tightly restricted area. Given the depth of the stratified deposits on the above discussed four sites, it is probable that these sites are only "the tip of the iceberg" and they have significant deposits. Even if this is not the case and they are small farmsteads, then these are an important part of understanding the Barnes period landscape in and around the environment of the Zebree site and the four larger sites discussed above. These three sites were not tested because of objections of the landowner.

Site 3MS473 is located at the transition between the sandy level laid down by the Buffalo Creek Braided surface period channel. The channel has filled with gleyed clays in the intervening years and these have preserved wood. During the summer of 1986 a mastodon was found preserved in these clays. The deposits which we excavated in the 1 X 1m test unit had a persistent low density of artifacts, which interestingly were mostly lithics. The artifact densities were so low both in the CSC, on the natural surface, on the spoil pile and in the test unit I do not believe that this site is significant in terms of the National Register of Historic places criteria.

PREDICTIVE STATEMENTS ABOUT THE POTENTIAL FOR BURIED SITES

There is an extremely high potential for buried sites anywhere along the Little River levee on the west side of Big Lake. This feature, which is called an escarpment with 3-4m of relief, the most relief in the project area, was an attractive dry place to live, offering a wide range of diverse resources. This environment along the channel and Relict Braided surface interface was rich and possibly the most diverse in a 10 km radius area. It would not surprise me at all if there are literally hundreds of discrete buried components all down this feature from the Missouri State line south to Manila. Recent conversations with Ms. Carol Spears suggests that this is also the case south of Manila.

The edge of the contact of the Relict Braided Surface with the clay-filled channel of the Buffalo Creek Valley (and other similar channels incised into Buffalo Island) is also a high probability area for buried deposits. There are a number of sites presently known in this environment that appear to be larger and much denser than 3MS473.

The Relict Braided Surface itself has a very low to nonexistent potential for buried sites. The shovel tests excavated across this sandy feature all penetrated to gleyed sands with concretions and other evidence of long soil development, not found on either of the edges where the buried archeological sites were found.

The bottom of Big Lake Swamp has a lower probability for buried sites, that is to say, the sites will be smaller and probably restricted to features which were much higher than the swamp per se. These will probably be in low density; however, where they occur, they are likely to have excellent preservation. These sites have been identified elsewhere in the Big Lake Swamp and the Tyronza Sunk Lands (Lafferty et al. 1986). Where these occur they are likely to be highly significant.

The edge of the Modern Meander Belt with the Relict Braided Surface and Big Lake Swamp is another high potential area for important occupation sites with buried deposits. While only one sherd was found in the Ditch 29 area survey in this environment, the depth and age of the deposits in the Pemiscot Bayou Core indicate that some of these areas and scars are likely to be of considerable antiquity. 3MS81 (Lafferty et al. 1984) had over a meter of Mississippian deposits under a meter-thick sterile clay cap, and other sites of greater antiquity are likely.

In surveying ditches in these three environments with a high potential for archeological sites, the best approach is to survey the spoil pile as well as the adjacent undisturbed portions of the impact zone. The spoil piles have always had indications of sites which are as deeply buried as 1.4m below surface. Shovel tests in these environments will not find these deeply buried deposits. I question their cost effectiveness based on my recent experience in northeast Arkansas in general and Mississippi County in particular.

PROPOSED IMPACTS

The original project plans called for greatly deepening the seep ditch around the west side of Big Lake Swamp, which would have destroyed large portions of sites 3MS21, 3MS119, 3MS199, and 3MS471. The Management Summary recommended much more testing of these sites, which we believed were highly significant, was needed to define the subsurface variation in the site, in order to complete National Register nominations and to plan mitigation intelligently. The Memphis District decided to avoid the site by cancelling the seep ditch enlargement from 3MS21 north to the Missouri State Line. Therefore, these four sites and 3MS475, 3MS476, and 3MS477 will not be impacted by this project.

The proposed work along the portion of the ditch across the Relict Braided Surface consists of clearing the vegetation and deepening by removing the silt that has accumulated during the past 3/4 century. It is our opinion that this will not adversely affect any of the insignificant archeological sites located in these areas of the project (3MS472, 3MS473, 3MS474, 3MS478).

RECOMMENDATIONS

1. The Memphis District of the Corps of Engineers has cancelled the proposed construction of the Seep Ditch north of the center of Section 5, T15N, R9E and the Missouri/Arkansas State line to avoid these sites.

2. No further archeological work is recommended at the insignificant archeological sites. Archeological clearance by the SHPO and State Archeologist should be granted for Ditch 29 where no sites were found and the east-west segments of Ditch 10 and Ditch 12 where the insignificant archeological sites were found.

SUMMARY AND CONCLUSIONS

This multidisciplinary archeological survey and testing with geomorphic and pollen analysis has produced results which have a significant bearing on our understandingof the evolution of the Mississippi Valley sediments, climate and occupation. Below, I summarize the major points which have been established or raised by this study.

The survey resulted in the discovery of prehistoric sites along the west edge of Big Lake and along the edge of Buffalo Creek ditch. No prehistoric sites were found on the Relict Braided Terrace nor in the backswamp east of Big Lake. This was consistent with the geomorphic interpretation (Chapter 5) and our understanding of the prehistoric settlement systems in the region. A major finding is that there is a thick extensive natural levee of the Little River on the west edge of Big Lake which spans or nearly spans Homo Tempus. We have hard evidence of stratified Woodland and Mississippian deposits and the geomorphic evidence and collections made by local persons strongly indicate that there are buried Archaic period and Dalton components in this formation. This inference is consistant with the geomorphic interpretation. There is reason to believe that similar deposits occur in the Buffalo Creek Valley, but the stratigraphic separartion of components is not as likely to be as much as near Big Lake.

The geomorphic reconstruction adds considerably to the base line data on the evolution of the landscape on and around the Relict Braided Surface. The cores from Big Lake and Pemiscot Bayou indicate that these features have existed for nearly ten millenia and that there is a complex geomorphic history attendant to each including several different cycles of deposition. This suggests that there may be more general stability of features in this environment than has been heretofore supposed.

The pollen analysis did not correlate directly with changes in the geomorphic cycles. It also raises questions as to the strength of the Hypsithermal and its impacts on human settlement in the region. Additional similar pollen cores need to be analyzed before a regional synthesis can be made of this data.

The analysis of sediments and site distributions indicated that there is high potential for sites to be buried in the Natural Levee along the west side of Big Lake and along the channels cutting the Relict Braided Surface Terrace. On this terrace there is no chance of buried sites and in the backswamp east of Big Lake there is low potential for sites. The levees on the meander belt have a higher potential.

The analysis of the historic sites in the project area follows what has been learned elsewhere in western Mississippi County (Lafferty et al. 1984; 1985a). Occupation was late in these poorly drained areas of the county, taking place after the swamps were drained and after the large land companies started selling off their holdings. Settlement began after 1910 on Buffalo Island with some large tracts still being sold as late as the mid-1930s. There appears to have been a large amount of construction of homes after World War II. Buffalo Island was held by small farmers until the present decade. The past several years has seen the disappearence of nearly half of the rural houses mapped in 1983 and many more stand abandoned as the process of consolidation into a few large tracts continues. Most of the smallest order centers are disappearing rather quickly and it is likely the Leechville and Manila will experience reductions in size and varieties of central services available in the next decade.

All eight of the historic components tested in the project were determined to be too recent to be significant in terms of the NRHP criteria. These will have ditch cleaning as the main impact and will therefore only be slightly adversely impacted by the proposed project.

The four large prehistoric sites are significant in terms of the NRHP criteria. The project has been discontinued in the part of this project area so that there will be no impact on these resources.

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APPENDIX A

SCOPE OF WORK

SECTION C - DESCRIPTION/SPECIFICATIONS (SCOPE OF WORK)

C-1. GENERAL.

C-1.1. The Contractor shall conduct a background and literature search, an intensive survey investigation, a geomorphic study, and initial site testing along Ditches 10, 12 and 29 in Mississippi County, Arkansas. Reports of these investigations shall be submitted. These tasks are in partial fulfillment of the Memphis District's obligations under the National Historic Preservation Act of 1966 (P.L. 89-665), as amended; the National Environment Policy Act of 1969 (P.L. 91-190); Executive Order 11593, "Protection and Enhancement of Cultural Environment," 13 May 1971 (36 CFR Part 800); Preservation of Historic and Archeological Data, 1974 (P.L. 93-291), as amended; and the Advisory Council on Historic Preservation, "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

C-1.2. Personnel Standards.

a. The Contractor shall utilize a systematic, interdisciplinary approach to conduct the study. Specialized knowledge and skills will be used during the course of the study to include expertise in archeology, history, architecture, geology and other disciplines as required to fulfill requirements of this Scope of Work. Techniques and methodologies used for the study shall be representative of the state of current professional knowledge and development.

b. The following minimal experiential and academic standards shall apply to personnel involved in investigations described in this Scope of Work:

(1) Archeological Project Directors or Principal Investigator(s) (PI). Individuals in charge of an archeological project or research investigation contract, in addition to meeting the appropriate standards for archeologist, must have a publication record that demonstrates extensive experience in successful field project formulation, execution and technical monograph reporting. It is mandatory that at least one individual acting as Principal Investigator or Project Director under this contract have demonstrated competence and ongoing interest in comparable cultural resources or archeological research in the Northeast Arkansas Region. Extensive prior research experience as Principal Investigator or Project Director in immediately adjacent areas will also satisfy this requirement. The requirement may also be satisfied by utilizing consulting Co-principal Investigators averaging no less than 24 paid hours per month for the duration of contract activities. Changes in any Project Director or Principal Investigator must be approved by the Contracting Officer. The Contracting Officer may require suitable professional references to obtain estimates regarding the adequacy of prior work.

(2) Archeologist. The minimum formal qualifications for individuals practicing archeology as a profession are a B.A. or B.S. degree from an accredited college or university, followed by a minimum of two years of successful graduate study or equivalent with concentration in anthropology and specialization in archeology and at least two summer field schools or their equivalent under the supervision of archeologists of recognized competence. A Master's thesis or its equivalent in research and publication is highly recommended, as is the M.A. degree.

(3) Architectural Historian. The minimum professional qualifications in architectural history are a graduate degree in architectural history, historic preservation, or closely related fields, with course work in American architectural history; or a bachelor's degree in architectural history, historic preservation, or closely related field plus one of the following:

(a) At least two years full-time experience in research, writing, or teaching in American history or restoration architecture with an academic institution, historical organization or agency, museum, or other professional institution; or

(b) Substantial contribution through research and publication to the body of scholarly knowledge in the field of American architectural history.

(4) Other Professional Personnel. All other personnel utilized for their special knowledge and expertise must have a B.A. or B.S. degree from an accredited college or university, followed by a minimum of two years of successful graduate study with concentration in appropriate study and a publication record demonstrating competing in the field of study.

(5) Other Supervisory Personnel. Persons in any supervisory position must hold a B.A., B.S. or M.A. degree with a concentration in the appropriate field of study and a minimum of 2 years of field and laboratory experience in tasks similar to those to be performed under this contract.

(6) Crew Members and Lab Workers. All crew members and lab workers must have prior experience compatible with the tasks to be performed under this contract. An academic background in the appropriate field of study is highly recommended.

c. All operations shall be conducted under the supervision of qualified professionals in the discipline appropriate to the data that is to be discovered, described or analyzed. Vitae of personnel involved in project activities may be required by the Contracting Officer at anytime during the period of service of this contract.

C-1.3. The Contractor shall designate in writing the name or names of the Principal Investigator(s). Participation time of the Principal Investigator(s) shall average a minimum of 50 hours per month during the period of service of this contract. In the event of controversy or court challenge, the Principal Investigator shall be available to testify with respect to report findings. The additional services and expenses would be at Government expense, per paragraph 1.8 below.

See attached
Amendment No. 0001

C-1.4. The Contractor shall keep standard field records which may be reviewed by the Contracting Officer. These records shall include field notes, appropriate state site survey forms and any other cultural resource forms and/or records, field maps and photographs necessary to successfully implement requirements of this Scope of Work.

C-1.5. To conduct the field investigation, the Contractor will obtain all necessary permits, licenses; and approvals from all local, state and Federal authorities. Should it become necessary in the performance of the work and services of the Contractor to secure the right of ingress and egress to perform any of the work required herein on properties not owned or controlled by the Government, the Contractor shall secure the consent of the owner, his representative, or agent, prior to effecting entry on such property.

C-1.6. Innovative approaches to data location, collection, description and analysis, consistent with other provisions of this contract and the cultural resources requirements of the Memphis District, are encouraged.

C-1.7. No mechanical power equipment other than that referenced in paragraph C-4.5 shall be utilized in any cultural resource activity without specific written permission of the Contracting Officer.

C-1.8. The Contractor shall furnish expert personnel to attend conferences and furnish testimony in any judicial proceedings involving the archeological and historical study, evaluation, analysis and report. When required, arrangements for these services and payment therefor will be made by representatives of either the Corps of Engineers or the Department of Justice.

C-1.9. The Contractor, prior to the acceptance of the final report, shall not release any sketch, photograph, report or other material of any nature obtained or prepared under this contract without specific written approval of the Contracting Officer.

C-1.10. The extent and character of the work to be accomplished by the Contractor shall be subject to the general supervision, direction, control and approval of the Contracting Officer. The Contracting Officer may have a representative of the Government present during any or all phases of Scope of Work requirements.

C-1.11. The Contractor shall obtain Corps of Engineers Safety Manual (EM 385 -1-1) and comply with all appropriate provisions. Particular attention is directed to safety requirements relating to the deep excavation of soils.

C-1.12. There will be two categories of meetings between Contractor and Contracting Officer: (1) scheduled formal conferences to review contract performance, and (2) informal, unscheduled meetings for clarification, assistance, coordination and discussion. The initial meeting shall be held prior to the beginning of field work. Category (1) meetings will be scheduled by the Contracting Officer and will be held at the most convenient location, to be chosen by the Contracting Officer. This may sometimes be on the project site, but generally will be at the office of the Contracting Officer.

C-2. STUDY AREA.

See attached
Amendment No. 0001

The study area consists of approximately 19.47 miles (31.33 kilometers) of channel improvement area along Ditches 10, 12 and 29 in Mississippi

County, Arkansas as shown on the attached maps. Project blueline drawings of the Ditch 29 area will be made available to the Contractor by the Government prior to the beginning of fieldwork. The Ditch 29 cultural resources survey segments shall be undertaken prior to the commencement of any other field activity in this Scope of Work. The following are study areas associated with each construction segment.

See attached Amendment No. 0001

1. Ditch 10. The Ditch 10 study area shall consist of right-of-way extending 200 feet (61 meters) landward of both top banks extending from the juncture of Ditch 10 and Buffalo Ditch No. 1 along Ditch 10, east and north, approximately 5.95 miles (9.58 kilometers) to a point 2,000 feet (610 meters) due south of the Missouri State line.

See attached Amendment No. 0001

2. Ditch 12. The Ditch 12 study area shall consist of a right-of-way extending 200 feet (61 meters) landward of both top banks extending approximately 5.95 miles (9.58 kilometers) from the juncture of Ditch 12 and Buffalo Ditch No. 1 along Ditch 12, east and north, to a point 1,580 feet (482 meters) due south of Ditch 10.

3. Ditch 29. The Ditch 29 study area shall consist of a right-of-way extending approximately 7.57 miles (12.18 kilometers) along Ditch 29 from the juncture of Ditch 29 and State Line Outlet Ditch to Project Station 401+100. Following are right-of-way areas for segments of the Ditch 29 study area.

a. Ditch 29, Segment 1. This segment runs from the juncture of Ditch 29 and State Line Outlet Ditch eastward .54 miles (.87 kilometers) to Station 29+00. The study area begins 300 feet landward of the left descending bank (south bank) and extends to 400 feet from top bank (a transect width of 100 feet).

b. Ditch 29, Segment 2. This portion of the study area continues from Mile .54 (station 29+00) to Mile .63 and ends at Station 34+00. The study area extends from the left descending bank (south bank) 400 feet landward.

c. Ditch 29, Segment 3. This segment continues from Mile .63 (Station 34+00) to Mile 3.35 and ends at Station 177+85. The study area extends from the left descending bank (south bank) 300 feet landward.

d. Ditch 29, Segment 4. This portion of the Ditch 29 study area continues from Mile 3.35 (Station 177+85) to Mile 6.41 and ends at Station 339+60. The study area extends from the left descending bank (south bank) 250 feet landward.

e. Ditch 29, Segment 5, The final segment of the study area continues from Mile 6.41 (Station 339+60) to Mile 7.57 and ends at Station 401+00. The segment extends from the left descending bank (south bank) 150 feet landward.

C-3. DEFINITIONS.

C-3.1. "Cultural resources" are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archeology, or culture of an area.

C-3.2. "Background and Literature Search" is defined as a comprehensive examination of existing literature and records for the purpose of inferring the potential presence and character of cultural resources in the study area. The examination may also serve as collateral information to field data in evaluating the eligibility of cultural resources for inclusion in the National Register of Historic Places or in ameliorating losses of significant data in such resources.

C-3.3. "Intensive Survey" is defined as a comprehensive, systematic, and detailed on-the-ground survey of an area, of sufficient intensity to determine the number, types, extent and distribution of cultural resources present and their relationship to project features.

C-3.4. "Mitigation" is defined as the amelioration of losses of significant prehistoric, historic, or architectural resources which will be accomplished through preplanned actions to avoid, preserve, protect, or minimize adverse effect upon such resources or to recover a representative sample of the data they contain by implementation of scientific research and other professional techniques and procedures. Mitigation of losses of cultural resources includes, but is not limited to, such measures as: (1) recovery and preservation of an adequate sample of archeological data to allow for analysis and published interpretation of the cultural and environmental conditions prevailing at the time(s) the area was utilized by man; (2) recording, through architectural quality photographs and/or measured drawings of buildings, structures, districts, sites and objects and deposition of such documentation in the Library of Congress as a part of the National Architectural and Engineering Record; (3) relocation of buildings, structures and objects; (4) modification of plans or authorized projects to provide for preservation of resources in place; (5) reduction or elimination of impacts by engineering solutions to avoid mechanical effects of wave wash, scour, sedimentation and related processes and the effects of saturation.

C-3.5. "Reconnaissance" is defined as an on-the-ground examination of selected portions of the study area, and related analysis adequate to assess the general nature of resources in the overall study area and the probable impact on resources of alternate plans under consideration. Normally reconnaissance will involve the intensive examination of not more than 15 percent of the total proposed impact area.

C-3.6. "Significance" is attributable to those cultural resources of historical, architectural, or archeological value when such properties are included in or have been determined by the Secretary of the Interior to be eligible for inclusion in the National Register of Historic Places after evaluation against the criteria contained in 36 CFR 63.

C-3.7. "Testing" is defined as the systematic removal of the scientific, prehistoric, historic, and/or archeological data that provide an archeological or architectural property with its research or data value. Testing may include controlled surface survey, shovel testing, profiling, and limited subsurface test excavations of the properties to be affected for purposes of research planning, the development of specific plans for research activities, excavation, preparation of notes and records, and other forms of physical removal of data and the material analysis of such data and material, preparation of reports on such data and material and dissemination of reports and other products of the research. Subsurface testing shall not proceed to the level of mitigation.

C-3.8. "Analysis" is the systematic examination of material data, environmental data, ethnographic data, written records, or other data which may be prerequisite to adequately evaluating those qualities which contribute to their significance.

C-4. GENERAL PERFORMANCE SPECIFICATIONS.

C-4.1. Research Design.

Survey and testing will be conducted within the framework of a regional research design including, where appropriate, questions discussed in the State Plan. All typological units not generated in these investigation, shall be adequately referenced. It should be noted that artifactual typologies constructed for other areas may or may not be suitable for use in the study area. It is, therefore, of great importance that considerable effort be spent in recording and describing artifactual characteristics treated as diagnostic in this study as well as explicit reasons for assigning (or not assigning) specific artifacts to various classificatory units.

C-4.2. Background and Literature Search.

a. This task shall include an examination of the historic and prehistoric environmental setting and cultural background of the study area and shall be of sufficient magnitude to achieve a detailed understanding of the overall cultural and environmental context of the study area. It is axiomatic that the background and literature search shall normally preceed the initiation of all fieldwork.

b. Information and data for the literature search shall be obtained, as appropriate, from the following sources: (1) Scholarly reports - books, journals, theses, dissertations and unpublished papers; (2) Official Records - Federal, state, county and local levels, property deeds, public works and other regulatory department records and maps; (3) Libraries and Museums - both regional and local libraries, historical societies, universities, and museums; (4) Other repositories - such as private collections, papers, photographs, etc.; (5) Archeological site files at local universities, the State Historic Preservation Office, the office of the State Archeologist; (6) Consultation with qualified professionals familiar with the cultural resources in the area, as well as consultation with professionals in associated areas such as history, sedimentology, geomorphology, agronomy, and ethnology.

c. The Contractor shall include as an appendix to the draft and final reports, written evidence of all consultation and any subsequent responses(s), including the dates of such consultation and communications.

d. The background and literature search shall be performed in such a manner as to facilitate the construction of predictive statements (to be included in the study report) concerning the probable quantity, character, and distribution of cultural resources within the project area. In addition, information obtained in the background and literature search should be of such scope and detail as to serve as an adequate data base for subsequent field work and analysis in the study area undertaken for the purpose of discerning the character, distribution and significance of specific identified cultural resources.

e. In order to accomplish the objectives described in paragraph C-4.2.d., it will be necessary to attempt to establish a relationship between landforms and the patterns of their utilization by successive groups of human inhabitants. This task should involve defining and describing various zones of the study area with specific reference to such variables as past topography, potential food resources, soils, geology, and river channel history.

C-4.3. Intensive Survey.

a. Intensive survey shall include the on-the-ground examination of the study areas described in paragraph C-2.

b. Unless excellent ground visability and other conditions conducive to the observation of cultural evidence occurs, shovel test pits, or comparable subsurface excavation units, shall be installed at intervals no greater than 30 meters throughout the study area. Note that auger samples, probes, and coring tools will not be considered comparable subsurface units. Shovel test pits shall be minimally 30 x 30 centimeters in size and extend to a minimum depth of 50 centimeters. Unit fill material shall be screened using 1/4" mesh hardware cloth. Additional shovel test pits shall be excavated in areas judged by the Principal Investigator to display a high potential for the presence of cultural resources. If, during the course of intensive survey activities, areas are encountered in which disturbance or other factors clearly and decisively preclude the possible presence of significant cultural resources, the Contractor shall carefully examine and document the nature and extent of the factors and then proceed with survey activities in the remainder of the study area. Documentation and justification of such action shall appear in the survey report. The location of all shovel test units and surface observations shall be recorded.

c. When cultural remains are encountered, horizontal site boundaries shall be derived by the use of surface observation procedures (including controlled surface collection procedures described in Paragraph C-4.4.a. below) in such a manner as to allow precise location of site boundaries on Government project drawings and 7.5 minute U.S.G.S. quad maps when available. Methods used to establish site boundaries shall be discussed in the survey report together with the probable accuracy of the boundaries. The Contractor shall establish a datum at the discovered cultural loci which shall be precisely related to the site boundaries as well as to a permanent reference point (in terms of azimuth and distance) by means of a transit level. If possible, the permanent reference point used shall appear on Government blueline (project) drawings and/or 7.5 minute U.S.G.S. quad maps. If no permanent landmark is available, a permanent datum shall be established in a secure location for use as a reference point. The permanent datum shall be precisely plotted and shown on U.S.G.S. quad maps and project drawings. All descriptions of site location shall refer to the location of the primary site datum.

d. All standing buildings and structures (other than those patently modern, i.e., less than 50 years old) shall be recorded and described. For a building to be considered "standing" it must retain four walls and at least a skeletal roof structure. A building or structure found in the field to be partially or totally collapsed will be considered an archeological site. In these cases, data concerning construction materials and techniques and floor plan, if discernible, must be collected. The Contractor shall supply preliminary information concerning the suitability of a structure or building for relocation and restoration (structural soundness for example).

C-4.4. Testing Activities.

a. Initial Site Testing.

(1) Surface collection of the site area shall be accomplished in order to obtain data representative of total site surface content. Both historic and prehistoric items shall be collected. The Contractor shall carefully note and record descriptions of surface conditions of the site including ground cover and the suitability of soil surfaces for detecting cultural items (ex: recent rainfall, standing water or mud). If ground surfaces are not highly conducive to surface collection, screened shovel tests units shall be used to augment surface collection procedures. It should be noted, however, that such units should be substituted for total surface collection only where the presence of ground cover requires such techniques.

(2) Care should be taken to avoid bias in collecting certain classes of data or artifact types to the exclusion of others (ex: debitage or faunal remains) so as to insure that collections accurately reflect both the full range and the relative proportions of data classes present (ex: the proportion of debitage to finished implements or types of implements to each other). Such a collecting strategy shall require the total collection of quadrat or other sample units in sufficient quantities to reasonably assure that sample data are representative of such descrete site subareas as may exist. Since the number and placement of such sample units will depend, in part, on the subjective evaluation of intrasite variability, and the amount of ground cover, the Contractor shall describe the rationale for the number and distribution of collection units. In the event that the Contractor utilizes systematic sampling procedures in obtaining representative surface samples, care should be taken to avoid periodicity in recovered data. No individual sample unit type used in surface data collection shall exceed 36 square meters in area. Unless a smaller fraction is approved by the Contracting Officer, surface collected areas shall constitute no less than 25 percent of total site areas. Detailed results of controlled surface collections shall be graphically depicted in plan view in the report of investigations.

(3) The Contractor shall undertake (in addition and subsequent to sample surface collecting) a general site collection in order to increase the sample size of certain classes of data which the Principal Investigator may deem prerequisite to an adequate site-specific and intersite evaluation of data.

(4) As an alternative to surface collecting procedures discussed above, where surface visability is excellent, the Contractor may collect all visable artifacts. If such a procedure is undertaken, the precise proveniences of all individual artifacts shall be related to the primary site datum by means of a transit level.

(5) Unless it can be conclusively demonstrated that no significant subsurface cultural resources occur at a site, the Contractor shall install in each appropriate site a minimum of one 1 X 1 meter subsurface test unit to determine the general nature of subsurface deposits.

(6) Subsurface test units (other than shovel cut units) shall be excavated in levels no greater than 10 centimeters. Where cultural zonation or plow disturbance is present however, excavated materials shall be removed by zones (and in 10 cm. levels within zones where possible). Subsurface test units shall extend to a depth of at least 20 centimeters below artifact bearing soils. A portion of each test unit, measured from one corner (of a minimum 30 X 30 centimeters), shall be excavated to a depth of 40 centimeters below artifact bearing soils. All excavated material (including plow zone material) shall be screened using a minimum of 1/4" hardware cloth. Representative profile drawings shall be made of excavated unit. Subsequent to preparation of profile drawings for each test unit, the unit shall be backfilled and compacted to provide reasonable pedestrian safety.

(7) Stringent horizontal spatial control of testing shall be maintained by relating the location of <u>all</u> collection and test units to the primary site datum either by means of a grid system (including those used in controlled surface collection) or by azimuth and distance.

(8) Other types of subsurface units may, at the Contractor's option, be utilized <u>in addition to</u> those units required by this Scope of Work.

(9) <u>Cultural Resource Recording and Numbering</u>. For each archeological site or architectural property recorded during the survey, the Contractor shall complete and submit the standard Arkansas archeological site or architectural property survey form, respectively. The Contractor shall be responsible for reproducing or obtaining a sufficient quantity of these forms to meet the needs of the project. The Contractor shall be responsible for coordinating with the appropriate state agency to obtain state site-file numbers for each archeological site and architectural property recorded.

b. Additional Investigations.

(1) Additional subsurface test units maybe rcquired at many loci. The proposed number and distribution of such test units shall be recommended by the Principal Investigator on a site specific basis. This recommendation shall be made based on such variables as site size and potential intrasite variability, including, physiographic and geomorphic characteristics of the loci which may suggest variability in the presence or distribution of subsurface cultural deposits. The Contractor shall detail the rationale(s) for the placement and numbers of proposed test units in the management summary and report of field activities. Additional reporting requirements, examination of background literature and examination of standing buildings and structures may also be required at some sites. The exact nature of additional examination, the schedule, and the price of the work shall be negotiated with the Contracting Officer, and if an agreement is reached, a Change Order shall be issued prior to conduct of the work. Additional investigations will provide a data base of sufficient nature to allow determination of site eligibility to the National Register of Historic Places consistent with C-5.3.j.12) and (3) of this Scope of Work.

(2) In order to accurately relate a site to research domains, (i.e. assess significance or insignificance), a variety of data gathering techniques may be required to insure recovery of the various types of data which may be present at the site. These techniques may include radiocarbon dating, flotation and excavation of cultural features. When appropriate, these types of data gathering activities should be integral elements of the testing strategy.

C-4.5. Geomorphological Study.

The Contractor shall undertake geomorphic examinations of the study area in order to determine the probability of the presence of significant subsurface cultural resources and the likely location and nature of those resources. The study shall focus on data relating to the age and nature of of soil deposits in the study area and the implications of those data regarding the probable presence, location, age and nature of significant cultural resources associated with these soils.

(1) The Contractor shall obtain sufficient field samples attributable to various temporal horizons to insure statistically reliable data for a minimum of two (2) palynological columns collected in such a manner as to allow taxa to be interpreted in paleoecological and paleoclimatic terms. Biostratigraphic chronological data shall be established by means of geomorphic and radiocarbon analysis. Obtaining suitable samples allowing the definition of continuous paleoenvironmental sequences during the full temporal range of human occupation of the study area shall be a prime consideration in the selection of sampling locations. Analysis of collected data shall be undertaken to supply a data base for the determination of the potential types and significance of buried cultural resources in the study area.

(2) The Contractor shall utilize hand excavation, power excavation and power coring equipment, as appropriate, to insure adequate depth and penetration of soils in the collection of data required for all investigative purposed described in paragraph C-4.5 of this Scope of Work.

(3) Investigations shall not include soils which are known to predate possible human occupation. All sampling areas shall be such as to yield data applicable to study areas.

(4) Investigations shall include carefully reasoned and documented recommendations and conclusions concerning:

a. the potential of the study area to contain buried significant cultural resources.

b. specific areas likely to contain significant cultural deposits and those unlikely to contain such deposits.

c. the likely nature of buried cultural deposits in the study area.

d. the need or lack of need for deep archeological testing in the study area.

e. if appropriate, a sampling plan for deep archeological testing including the numbers, type and location of proposed deep testing units.

(5) Although limited geological field observations and testing will be necessary to obtain data, it is not anticipated that extensive subsurface testing will be required. If additional deep archeological testing is deemed necessary by the Contractor, the number, placement, techniques, time requirements and cost to the Government of such testing shall be negotiated with the Contracting Officer, and if an agreement is reached, a Change Order shall be issued prior to the conduct of the work.

C-4.6. Laboratory Processing, Analysis, and Preservation.

All cultural materials recovered will be cleaned and stored in deterioration resistant containers suitable for long term curation. Diagnostic artifacts will be labeled and catalogued individually. A diagnostic artifact is defined herein as any object which contributes individually to the needs of analysis required by this Scope of Work or the research design. All other artifacts recovered must minimally be placed in labeled, deterioration resistant containers, and the items catalogued. The Contractor shall describe and analyze all cultural materials recovered in accordance with current professional standards. Artifactual and non-artifactual analysis shall be of an adequate level and nature to fulfill the requirements of this Scope of Work. All recovered cultural items shall be catalogued in a manner consistent with Arkansas state requirements. The Contractor shall consult with appropriate state officials as soon as possible following the conclusion of field work in order to obtain information (ex: accession numbers) prerequisite to such cataloging procedures.

C-4.7. Curation.

Efforts to insure the permanent curation of properly cataloged cultural resources materials and project documentation in an appropriate institution shall be considered an integral part of the requirements of this Scope of Work. The Contractor shall pay all cost of the preparation and permanent curation of records and artifacts. An arrangement for curation shall be confirmed by the Contractor, subject to the approval of the Contracting Officer, prior to the acceptance of the final report.

C-5. GENERAL REPORT REQUIREMENTS.

C-5.1. The primary purpose of the cultural resources report is to serve as a planning tool which aids the Government in meeting its obligations to preserve and protect our cultural heritage. The report will be in the form of a comprehensive, scholarly document that not only fulfills mandated legal requirements but also serves as a scientific reference for future cultural resources studies. As such, the report's content must be not only descriptive but also analytic in nature.

C-5.2. Upon completion of all field investigation and research, the Contractor shall prepare a report detailing the work accomplished, the results, and recommendations for each project area. Copies of the draft and final reports of investigation shall be submitted in a form suitable for publication and be prepared in a format reflecting contemporary organizational and illustrative standards for current professional archeological journals. The final report shall be typed on standard size 8-1/2" x 11" bond paper with pages numbered and with page margins one inch at top, bottom, and sides. Photographs, plans, maps, drawings and text shall be clean and clear.

C-5.3. The report shall include, but not necessarily be limited to, the following sections and items:

a. Title Page. The title page should provide the following information; the type of task undertaken, the study areas and cultural resources which were assessed; the location (county and state), the date of the report; the contract number; the name of the author(s) and/or the Principal Investigator; and the agency for which the report is being prepared. If a report has been authored by someone other than the Principal Investigator, the Principal Investigator must at least prepare a foreword describing the overall research context of the report, the significance of the work, and any other related background circumstances relating to the manner in which the work was undertaken.

b. Abstract. an abstract suitable for publication in an abstract journal shall be prepared and shall consist of a brief, quotable summary useful for informing the technically-oriented professional public of what the author considers to be the contributions of the investigation to knowledge.

c. Table of Contents.

d. Introduction. This section shall include the purpose of the report, a description of the proposed project, a map of the general area, a project map, and the dates during which the investigations were conducted. The introduction shall also contain the name of the institution where recovered materials and documents will be curated.

e. Environmental Context. This section shall contain, but not be limited to, a discussion of probable past floral, faunal, and climatic characteristics of the project area. Since data in this section may be used in the evaluation of specific cultural resource significance, it is imperative that the quantity and quality of environmental data be sufficient to allow subsequent detailed analysis of the relationship between past cultural activities and environmental variables.

f. Previous Research. This section shall describe previous research which may be useful in deriving or interpreting relevant background data, problem domains, or research questions and in providing a context in which to examine the probability of occurrence and significance of cultural resources in the study area.

g. Literature Search and Personal Interviews. This section shall discuss the results of the literature search, including specific data sources, and personal interviews which were conducted during the course of investigations.

i. Survey, Testing and Analytical Methods. This section shall contain an explicit discussion of the research design, and shall demonstrate how environmental data, previous research data, the literature search and personal interviews have been utilized in constructing the strategy. Specific research domains and questions as well as methodological strategies employed to address those questions should be included where possible.

j. Recommendations.

(1) This section should contain, where possible, assessments of the eligibility of specific cultural properties in the study area for inclusion in the National Register of Historic Places.

(2) Significance should be discussed explicitly in terms of previous regional and local research and relevant problem domains. Statements concerning significance shall contain a detailed, well-reasoned argument for the property's research potential in contributing to the understanding of cultural patterns, processes or activities important to the history or prehistory of the locality, region or nation, or other criteria of significance. Conclusions concerning insignificance likewise, shall be fully documented and contain detailed and well-reasoned arguments as to why the property fails to display adequate research potential or other characteristics adequate to meet National Register criteria of significance. For example, conclusions concerning significance or insignificance relating solely to the lack of contextual integrity due to plow disturbance or the

lack of subsurface deposits will be considered inadequate. Where appropriate, due consideration should be given to the data potential of such variables as site functional characteristics, horizontal intersite or intrasite spatial patterning of data and the importance of the site as a representative systemic element in the patterning of human behavior. All report conclusions and recommendations shall be logically and explicitly derived from data discussed in the report.

(3) The significance or insignificance of cultural resources can be determined adequately only within the context of the most recent available local and regional data base. Consequently the evaluation of specific individual cultural loci examined during the course of contract activities shall relate these resources not only to previously known cultural data but also to a synthesized interrelated corpus of data including those data generated in the present study.

(4) Where appropriate, the Contractor shall provide alternative mitigation measures for significant resources which will be adversely impacted. Data will be provided to support the need for mitigation and the relative merits of each mitigation design will be discussed. Preservation of significant cultural resources is nearly always considered preferable to recovery of data through excavation. When a significant site can be preserved for an amount reasonably comparable to, or less than the amount required to recover the data, full consideration shall be given to this course of action.

k. References (American Antiquity Style).

l. Appendices (Maps, Correspondence, etc.). A copy of this Scope of Work and, when stipulated by the Contracting Officer, review comments shall be included as appendices to the final report of investigations.

C-5.4. The above items do not necessarily have to be discrete sections; however, they should be readily discernible to the reader.

C-5.5. In order to prevent potential damage to cultural resources, no information shall appear in the body of the report which would reveal precise resource location. All maps which indicate or imply precise site locations shall be included in reports as a readily removable appendix (e.g. envelope).

C-5.6. No logo or other such organizational designation shall appear in any part of the report (including tables or figures) other than the title page.

C-5.7. Unless specifically otherwise authorized by the Contracting Officer, all reports shall utilize permanent site numbers assigned by the state in which the study occurs.

C-5.8. All appropriate information (including typologies and other classificatory units) not generated in these contract activities shall be suitably referenced.

C-5.9. Reports shall contain site specific maps. Site maps shall indicate site datum(s), location of data collection units (including shovel cuts, subsurface test units and surface collection units), site boundaries in relation to proposed project activities, site grid systems (where appropriate), and such other items as the Contractor may deem appropriate to the purposes of this contract.

C-5.10. Information shall be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective and advantageous to communicate necessary information. All tables, figures and maps appearing in the report shall be of publishable quality.

C-5.11. Any abbreviated phrases used in the text shall be spelled out when the phrase first occurs in the text. For example use "State Historic Preservation Officer (SHPO)" in the initial reference and thereafter "SHPO" may be used.

C-5.12. The first time the common name of a biological species is used it should be followed by the scientific name.

C-5.13. In addition to street addresses or property names, sites shall be located on the Universal Transverse Mercator (UTM) grid.

C-5.14. Generally, all measurements should be metric.

C-5.15. As appropriate, diagnostic and/or unique artifacts, cultural resources or their contexts shall be shown by drawings or photographs.

C-5.16. Black and white photographs are preferred except when color changes are important for understanding the data being presented. No instant type photographs may be used.

C-5.17. Negatives of all black and white photographs and/or color slides of all plates included in the final report shall be submitted to the Contracting Officer.

C-6. SUBMITTALS.

C-6.1. An extensive management summary shall be submitted, in accordance with the schedule in paragraph C-7.1, to the Contracting Officer within 14 days of the completion of survey and initial testing. The management summary shall describe survey and initial testing methods and the data yielded by those methods. Where survey data, initial testing data and other sources of data are adequate, the Contractor shall evaluate cultural resources identified during survey activities in terms of eligibility for inclusion in the National Register of Historic Places. The evaluation shall be consistent with requirements in paragraph C-5.3.j. of this Scope of Work. Where inadequate data exist for such an evaluation, the Contractor shall recommend specific additional studies, as described in paragraph C-4.4.b. of this Scope of Work, necessary to obtain adequate data for such National Register evaluation. The management summary shall include project maps showing boundaries of discovered cultural resources relative to project rights-of-way. The management summary shall also contain recommendations, based on geomorphic and other data, concerning the need for deep cultural resources testing and the type, numbers and locations of needed deep test units.

C-6.2. The Contractor shall submit 6 copies of the draft report and one original and 75 copies with high quality binding, of the final report which include appropriate revisions in response to the Contracting Officer's comments.

C-6.3. The Contractor shall submit under separate cover 6 copies of appropriate 15' quadrangle maps (7.5' when available) or other site drawings which show exact boundaries of all cultural resources within the project area and their relationship to project features.

C-6.4. The Contractor shall submit to the Contracting Officer completed National Register forms including photographs, maps, and drawings in accordance with the National Register Program, if any sites inventoried during the survey are found to meet the criteria of eligibility for nomination and for determination of significance. The completed National Register forms shall be submitted with the final report.

C-6.5. At any time during the period of service of this contract, upon the written request of the Contracting Officer, the Contractor shall submit, within 15 calendar days, any portion or all field records described in paragraph C-1.4 without additional cost to the Government.

C-6.6. When cultural resources are located during intensive survey activities, the Contractor shall supply the appropriate State Historic Preservation Office with completed site forms, survey report summary sheets, maps or other forms as appropriate. Blank forms may be obtained from the State Historic Preservation Office. Copies of such completed forms and maps shall be submitted to the Contracting Officer within 30 calendar days of the end of fieldwork.

C-6-7. The Contractor shall prepare and submit with the final report, a site card for each identified resource or aggregate resource. These site cards do not replace state approved prehistoric, historic, or architectural forms or Contractor designed forms. These 5 X 8 inch cards shall be color-coded. White cards shall be used for prehistoric sites, blue cards for historic sites, green for architectural sites and yellow cards for potentially significant sites. Sites fitting two or more categories will have two or more appropriate cards. This site card shall contain the following information, to the degree permitted by the type of study authorized:

a. Site number

b. Site name

c. Location: section, township, and UTM coordinates (for procedures in determining UTM coordinates, refer to How to Complete National Register Forms, National Register Program, Volume 2.

d. County and state

e. Quad maps

f. Date of record

g. Description of site

h. condition of site

i. Test excavation results

j. Typical artifacts

k. Chronological position (if known)

l. Relation to project

m. Previous studies and present contract number

n. Additional remarks

C-6.8. Documentation. The Contractor shall submit detailed monthly progress reports to the Contracting Officer by the 7th day of every month for the duration of the contract. These reports will contain an accurate account of all field work, laboratory procedures and results in sufficient detail to allow monitoring of project progress.

C-7. SCHEDULE.

C-7.1. The Contractor shall, unless delayed due to causes beyond his control and without his fault or negligence, complete all work and services under this contract within the following time limitations.

Activity	Completion Time (In calendar days beginning with acknowledged date of receipt of notice to proceed)
Survey/Initial Testing Fieldwork	60
Submittal Management Summary	74
Submittal of Draft Report of Investigations	164
Submittal of Final Report of Investigations	244

C-7.2. The Contractor shall make any required corrections after review by the Contracting Officer. The Contracting Officer may defer Government review comments pending receipt of review comments from the State Historic Preservation Officer or other reviewing agencies. More than one series of draft report corrections may be required. In the event that the government review period (50 days) is exceeded and upon request of the Contractor, the contract period will be extended automatically on a calendar day for day basis. Such extension shall be granted at no additional cost to the Government.

APPENDIX B

ARCHEOLOGICAL SITES

by

Robert H. Lafferty III

and

Paul F. Baumann

with Archival Documentation by

Beverly J. Watkins

SIGNIFICANT SITES

SITE 3MS199

Description

Period/Time: Prehistoric Early Mississippian, Early (?), Middle, Late Woodland, Historic (GLO)

Estimated Site Area: >6 ha (15 acres)

CSC (Square meters): 2,525

Maximum known depth: 74cm

Nature: Scatter of prehistoric and historic materials on both sides of the ditch, and possibly north into Missouri. The site was originally recorded as a General Land Office (GLO) site. The controlled surface collection (CSC) extended 300m (north-south) on the levee side of the ditch (east) and 100m west of the ditch to the limit of the site. The north site limit is currently undefined and the east edge is under the Big Lake Levee. The north part of the site is on Tiptonville-Dubbs soil complex and the latter is on Dundee Silt loam. Both of these soils are described as being alluvial levee soils which are well drained. The

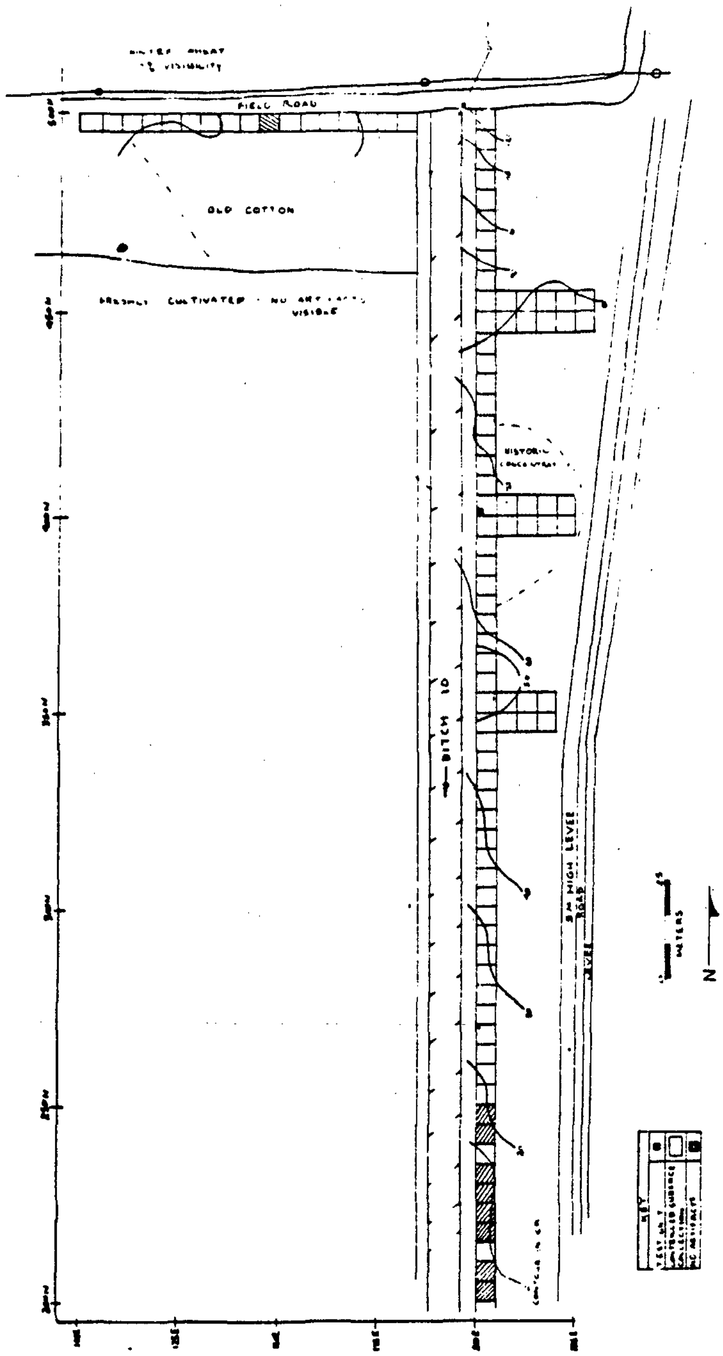

Figure B-1. 3MS199, site map.

Dundee soil extends in a band on the west side of Big Lake from the center of 3MS199 south for almost two miles (Ferguson and Gray 1971:Sheet 2)and has two other large prehistoric sites situated on it (3MS21 and 3MS471). The test unit was placed on Dundee soils in a high density of the scatter at 400N100E, and archeological materials were recovered to 74cm BS. This was apparently stratified in a sandy matrix with a little carbon observed in the matrix. Below the base of the plowzone at 30cm the whole deposit was stratified Woodland period ceramics, which were largely Barnes Cordmarked. Three rim sherds and a possible lizard effigy were recovered in this unit. The sherd density was as high as 600 per cubic meter.

Methods of Testing and Results

This site was tested with a CSC, a 1m x 1m test unit and supplemented by a general select collection of diagnostic artifacts.

General Surface Collection contains 335 artifacts (Table C-1). Of these 190 are prehistoric Woodland sherds, 151 of which are Barnes Plain. Most of the rest are Barnes Cordmarked and two are otherwise decorated. Three sherds were grog-tempered. Interestingly, no shell-tempered sherds were recovered from the test unit and these were in low density in the CSC. Diagnostic historic artifacts include whiteware, stoneware with an Albany slip, clear curved glass, a machine made marble and aluminum fragments. These indicate a late 19th into the 20th century period of use.

Controlled Surface Collection contained 1204 artifacts from 101 25m square units (Table C-1). The south edge of the continuous distribution of artifacts is at 250N and the west is beyond 100E. The north and east edges are currently undefined. There are considerable differences in the densities of artifacts on the surface (Figures B-2 to B-6). There are concentrations of historic materials at 350N, and 405N (Figure B-2). There is a relatively low density of historic construction materials (Figure B-3) which do not contour.

The most common artifacts recovered in the CSC were Barnes Plain (Figure B-4) and Barnes Cordmarked (Figure B-5) ceramics. These ceramics were concentrated in contourable concentrations at ~400N and ~350N for the former and at 475N for the cordmarked. Included in the cordmarked counts were "decorated weathered" sherds which were probably cordmarked but are too weathered to tell for certain. The reason for these concentrations could be that either these were habitation loci on the larger site or the larger site was intermittently occupied in different places in succession. Only excavation at more of the site will determine this.

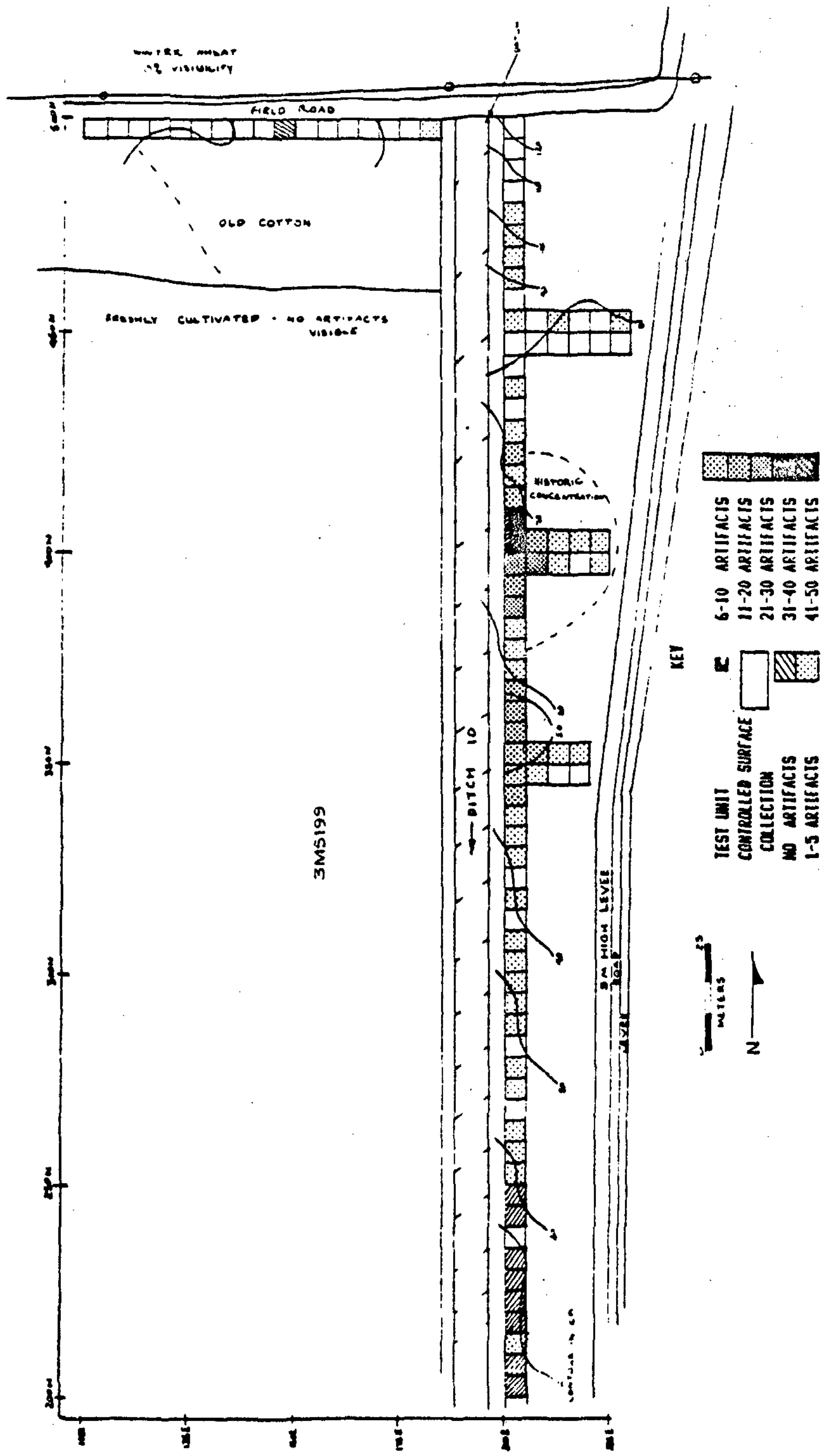

Figure B-2. 3MS199, CSC, Historic Sherds (counts).

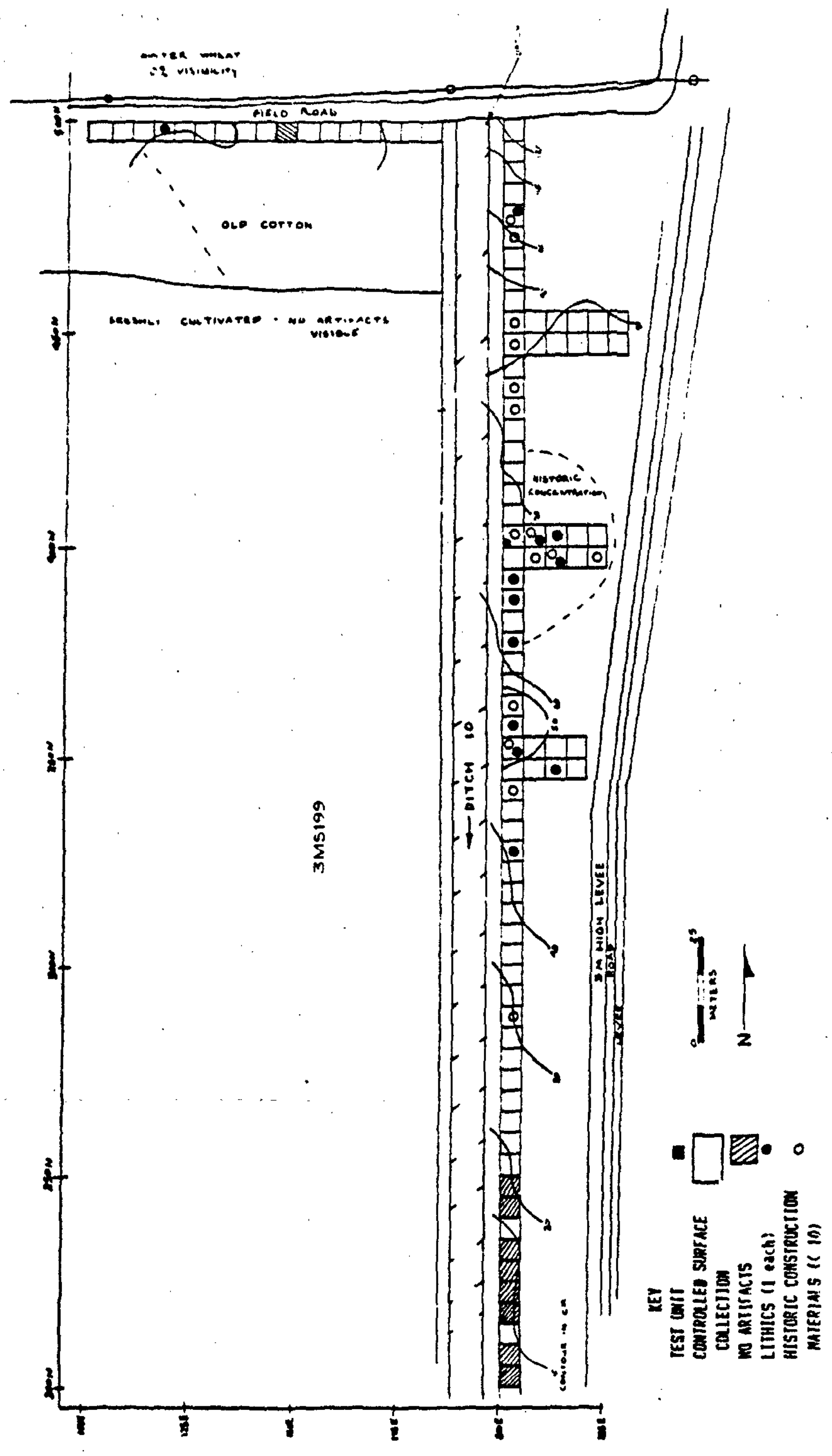

Figure B-3. 3MS199, CSC, Historic Construction Material and Prehistoric Lithics.

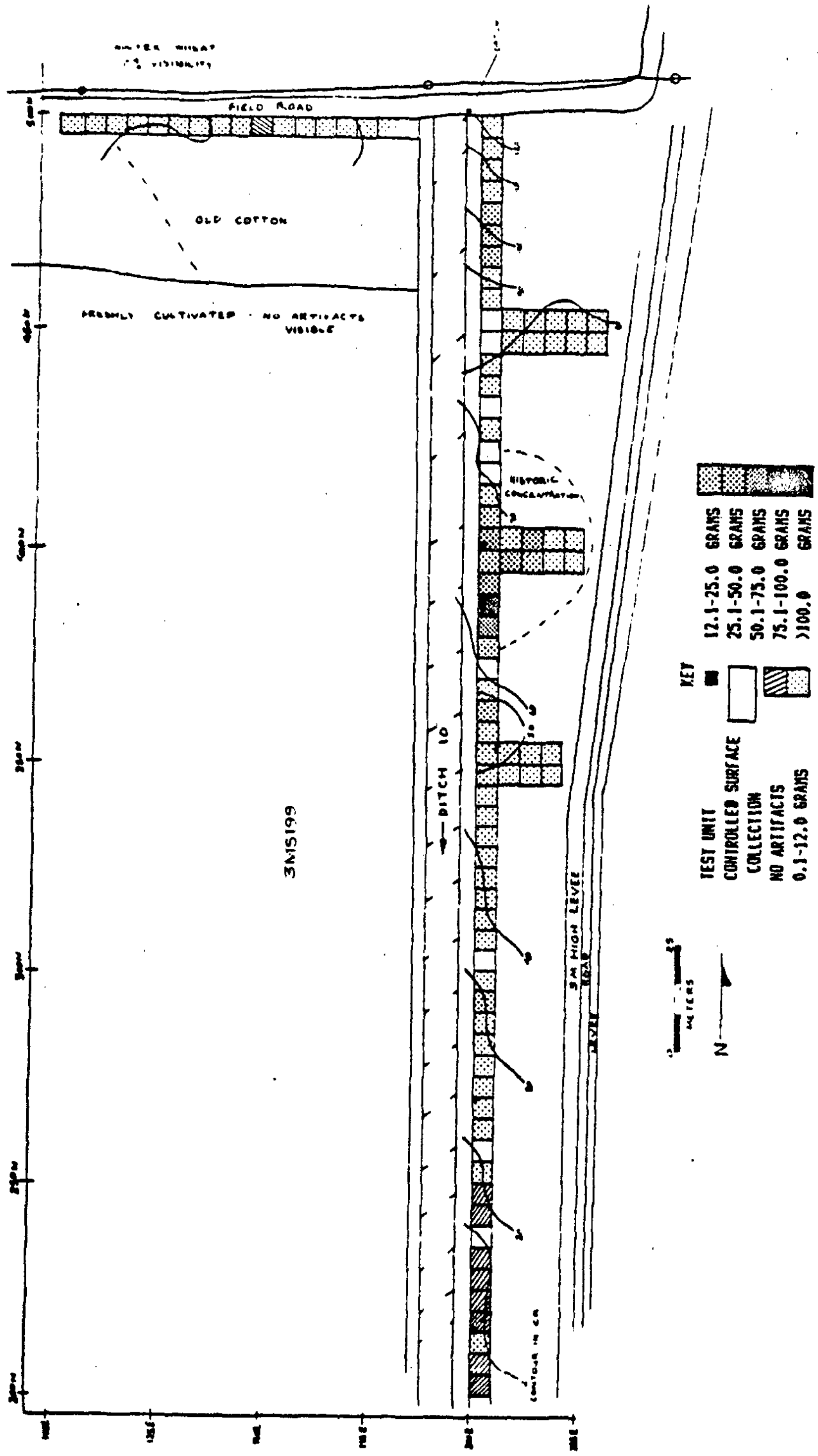

Figure B-4. 3MS199, CSC, Barnes Plain Ceramics (grams).

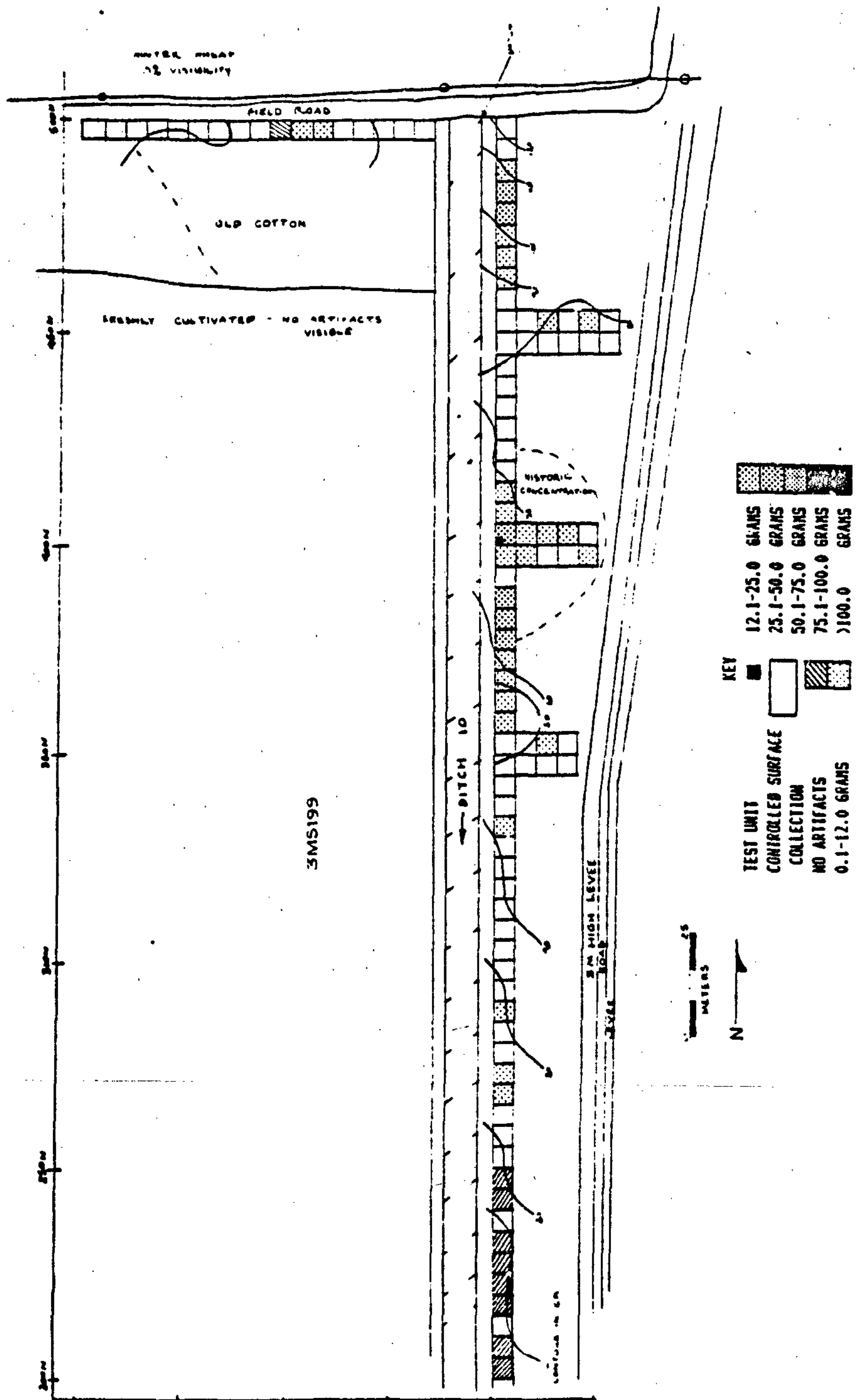

Figure B-5. 3MS199 CSC, Barnes Cordmarked and Decorated Weathered Sand Tempered Sherds (grams).

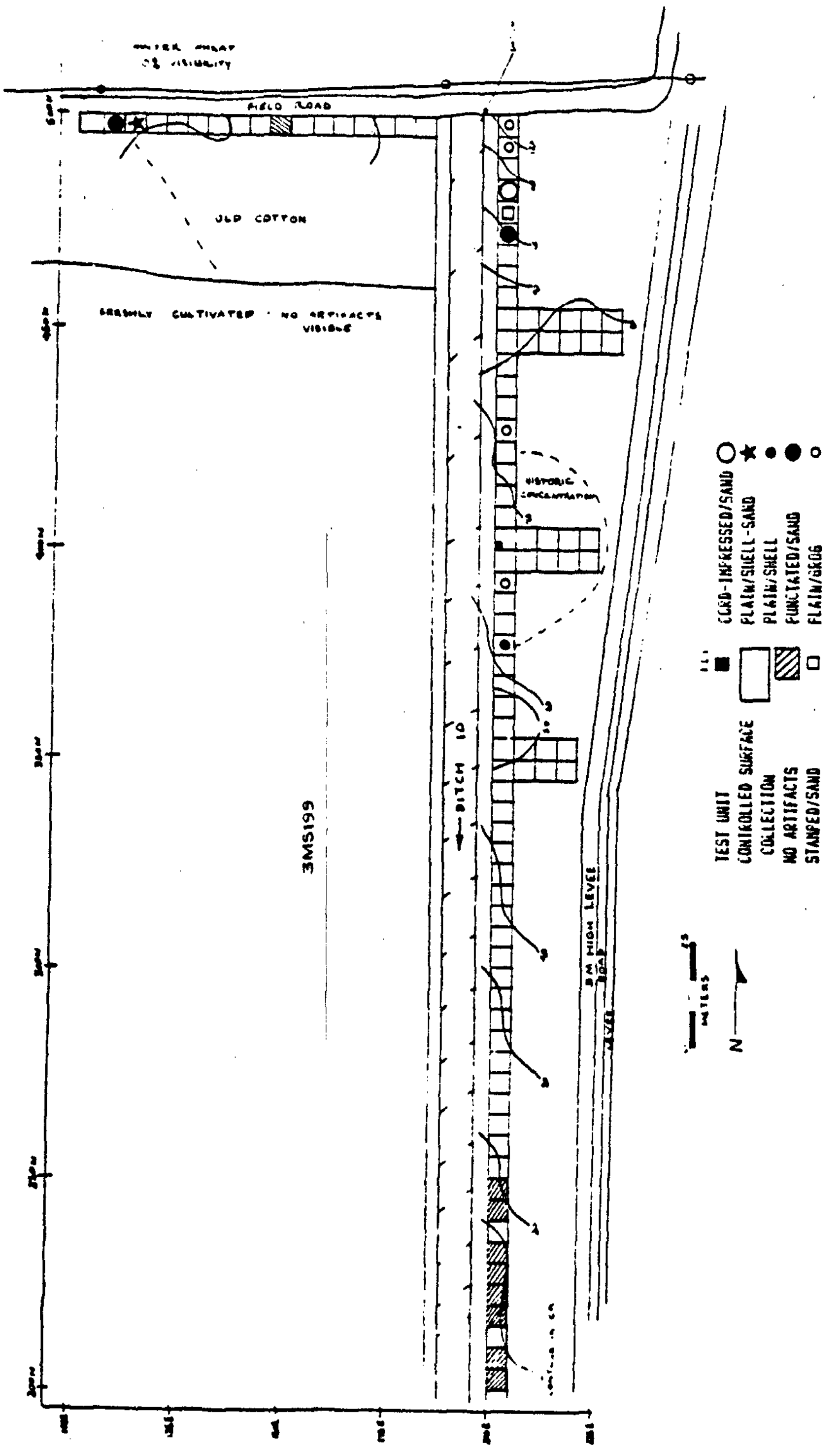

Figure B-6. 3MS199, CSC, Grog, Shell and Mixed Temper Sherds (grams).

Three shell-tempered sherds and 15 grog-tempered sherds were recovered in the CSC. A concentration of these low frequency sherds was at the north end of the CSC (Figure B-6). The overwhelming majority of the artifacts recovered in the CSC were Woodland period ceramics followed by historic shards and glass. Lithics were in very low densities and consisted mainly of chert and quartzite flakes (Table C-2).

Test Unit 1 was near the center of the 405N concentration, which produced the greatest density of prehistoric pottery, with surface densities exceeding one sherd per square meter. This was also the highest density of historic materials.

Test Unit 1 was excavated at 400N200E in what was impressionistically determined, after making the CSC, to be a high density area of artifacts (Figure B-4). The unit was excavated to 95cm below surface in 10cm levels after excavating the 15cm thick upper plowzone (Figure B-7). The plowzone extended to 25cm below surface and was composed of a dark brown fine silty loam in which the sherds were of a small size. This was underlain by a darker brown silty loam with larger sherds. This level was quite distinct from the homogeneous plowzone and was heavily mottled. The gray mottling and concretions increased in density, intensity and variety with increasing depth. The texture was consistently silty to the bottom of the profile. Sherd size generally increased with depth to 65-70cm below surface, but became fewer in number. A thin concentration of sherds was noted at 65-70cm and the artifacts terminated abruptly below 74cm below surface.

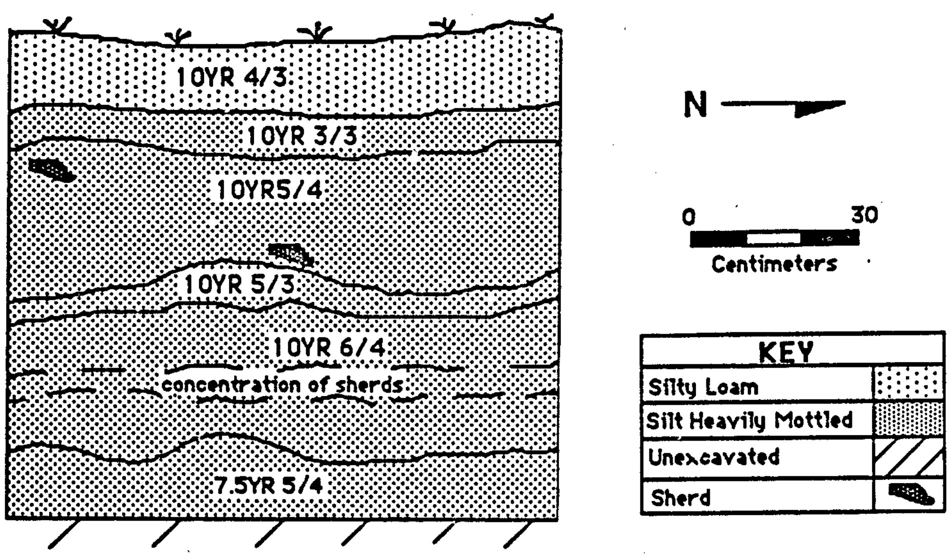

Figure B-7. 3MS199, Test Unit 1, west wall profile.

Table B-1. 3MS199, Test Unit 1, Prehistoric Ceramics and other selected artifacts (counts)

	Historic		Temper	Barnes			Daub	Flakes
Depth Cm BS.	Sherd	Metal	Grog	Plain	Cdmkd.	Dec.		
0-10	17	12	3	70	3			
10-14	10	5	2	22+	2			
14-24	3	2		51+	22			
24-34			2	82	11	9	2	1
34-44				56	18	6		1
44-54				12*	15	1		
54-64				6	12		1	
64-74			3	10	6		5	
74-84								
84-94								
Total	30	19	10	309	89	16	8	2

Tables B-1 and C-2 present the distribution of archeological materials recovered from the excavation unit. Counts are summarized in Table B-1 which excludes the smaller fragments that were weighed but not counted. Most of the historic material was recovered in the plowzone. Five historic fragments recovered from the top of the 14-24cm cut were very small, weighing 4 grams. These were probably transferred from above by bioturbation. Below 14cm BS we are essentially in pure Woodland deposits. Most of the grog tempered sherds are in the upper parts of this unit, but 3 sherds are from the lowest anthropic level. These suggest contact between the Barnes and Baytown peoples and are consistent with other sites of this period elsewhere in Mississippi County. Generally speaking there is an increasing proportion of Barnes Cordmarked ceramics with increasing depth. Scattered in the test unit are large pieces of daub. As some of these have large cane impressions, we believe that there are probably Woodland period houses on the site.

Historic Documentation

Historic Maps: This site was first recorded on the presence of a field on the 1839 GLO map. In 1945 there were no structures shown at this location on the United States Geological Survey (USGS) Manila 15' quadrangle map. This lack of structure and lack of building materials in the collection suggest that the historic component was a dump site.

Archival Documentation: Sites 3MS199, 3MS471, 3MS119, 3MS21, and 3MS472 had a common history through much of their documentation period and this is discussed here. These sites are all on lowlands that became available for purchase under the Swamp Land Act of 1850. On 12 July 1852 Dozier Thornton of Cherokee County, Alabama, Jeptha Fowlkes of Shelby County, Tennessee, and J.W. Lumpkin (residence unknown) entered 52,928 acres of Mississippi County in Thornton's name. The men paid $32,798 for this land. Between 1852 and 1858, Fowlkes bought out Lumpkin's share; and Dozier Thornton sold his share to N.M. Thornton of Cherokee County, Alabama, and H. Smith of Mobile County, Alabama. On 10 December 1858 an agreement was drawn up to divide the land. N.M. Thornton and H. Smith got 20,315 acres including 3MS21; Fowlkes got 25,919 acres including 3MS119 and 3MS472. The last 6,775 acres, including 3MS199 and 3MS471, was to be held jointly to secure the debt remaining from the original purchase. On the same day Fowlkes executed a deed to Thornton and Smith for their portion of the division (Mississippi County Deed Record, Osceola 1:516-519, 520-525).

Fowlkes died in 1863. His heirs were unable to pay the debts on this parcel of his land, so in 1869 it was sold on the steps of the courthouse in Memphis. The buyers were Smith and Thornton, who acquired Fowlkes portion of the 1858 division of property, as well as full title to the lands that were held jointly (Mississippi County Deed Record, Osceola 2:277-282).

Whatever plans these investors had for their Arkansas lands did not work out. On 7 December 1874, H. Smith, living in New Orleans, sold 44,991 acres in Mississippi County as well as land in Craighead County to J. Morgan Smith of Talladega, Alabama, for $1500 (Mississippi County Deed Record, Osceola 6:99-105). J. Morgan Smith then joined John T. Burns to form the mercantile business of Smith & Burns, probably using a mortgage on Smith's land in Mississippi County for capital to get the company started (Mississippi County Deed Record, Osceola 6:136-140). More money was needed, and on 13 September 1875 they mortgaged all of their land in Craighead, Mississippi, Greene, and Clayton (now Clay) Counties to Charles Hodgman of St. Louis, with Leonard Matthews and Edward Whitaker of St. Louis as trustees to oversee the repayment of the debt (Mississippi County Deed Record, Osceola 6:219-223, 236-245).

By 1876 Smith & Burnes had established stores in Osceola and on Big Lake. Smith, who had been living in Osceola, decided to return to Talladega, Alabama, and gave Burns his power of attorney over all "land, houses, and real estate," with specific authority "to rent and collect rents" on the land until it could be sold (Mississippi County Deed Record, Osceola 6:376-77). The business did not prosper, however, and on 3 June 1876 the land went to Leonard Matthews and Edward Whitaker, doing business as Matthews & Whitaker, to satisfy the 1875 mortgage (Mississippi County, Osceola 7:17-20).

Matthews & Whitaker soon began selling their extensive properties, so from this point each of the five sites has a slightly different history.

Twenty-six acres, which include 3MS199, were sold by Matthews & Whitaker to Burel Kilen on 15 December 1834. Because the amount was $1 and "other valuable considerations" Kilen may have been either a relative or an employee. The deed was endorsed by Kilen's heirs as being transferred to John Spears on 16 July 1885 (Mississippi County Deed Record, Osceola 17:611). Spears then sold the property to William H. Harrison for $3000 on 22 February 1888 (Mississippi County Deed Record, Osceola 15:71). Harrison remained the owner until about 1914 when the taxes are shown as owed by Zebro Harrison, probably an heir. By 1920 the property was no longer listed on the tax books (Mississippi County Real Estate Tax Records, Blytheville 1913-1940).

Proposed Site Function and Cultural Affiliations

The presence of pottery, daub and utilized flakes all suggest that this was an occupation site with numerous structures which was probably occupied through substantial parts of the Woodland period. There is a small Mississippian component located between 350N and 400N and a Historic component.

Management Department

NRHP Significance: This site is stratified and has what is probably a Woodland sequence capped by Mississippian in some areas. There are deeply buried deposits and given the surface of the prehistoric landscape there is every reason to expect that there are deposits which are deeper and more highly stratified. This site has important data on the little understood Woodland period in the Central Mississippi River Valley. This site is definitely significant in terms of the NRHP criteria.

Data Limitations: The surface limits of the site have not been fully defined by controlled surface collection. We have even less understanding of the subsurface extent of the site and what variation is present in site depth.

Proposed Impacts: This site is currently cut by Ditch 10 and will have a much larger area excavated on the east side where the levee is located.

CRM Recommendations: (1) More extensive testing to define site limits and to document more fully artifact variation and surface limit, (2) Route project around the site, or, (3) cancel this section of the project.

SITE 3MS471 (2B)

Description

Period/Time: Middle and Early Mississippian, Woodland & Historic (19th century)

Estimated Site Area: 3.5 ha

CSC (Square meters): 1,000

Maximum known depth: 55 cm BS

Nature: Scatter of historic and prehistoric materials in plowed field. The site is situated on a small knoll composed of Dundee Silt Loam (Ferguson and Gray 1971:Sheet 2) at the end of what appears to be a long north-south-trending ridge (Figure B-8). Most of the historic material was recovered in the swale to the west of the prehistoric component. There were large prehistoric sherds in a fairly dense concentration on the highest part of the site. The test unit was excavated in this part but the CSC was made at a later date after the freshly plowed surface had been rained on. The CSC area was severely restricted in extent by the seep ditch which had flooded all but the highest part of the site. The test unit was excavated to 75cm BS. The cultural bearing matrix was obvious and present to 55cm where it abutted the B Horizon soils.

Methods of Testing and Results

The site was tested with a controlled surface collection, and a test unit. When we first went to test the site it had been freshly disced and we had to return several weeks later to carry out the controlled surface collection. By that time there had been so much rain that the low part of the site was flooded and inaccessible to our crew.

General Surface Collection

Table C-3 presents the the 321 artifacts collected in the grab samples. These materials came from both sides of the ditch and fairly well represent the range of materials found in the other collections; however, there are unique artifacts (e.g. Dover Hoe) which are not in the other collections. These materials generally indicate a period of occupation from the Woodland through the Mississippian and into the twentieth century of the Historic period. Most of the historic material was collected east of the prehistoric component near the low sandy area. Only 4 historic sherds were recovered in the CSC. This area corresponds to the marked location of a house site shown on the 1945 USGS quadrangle map.

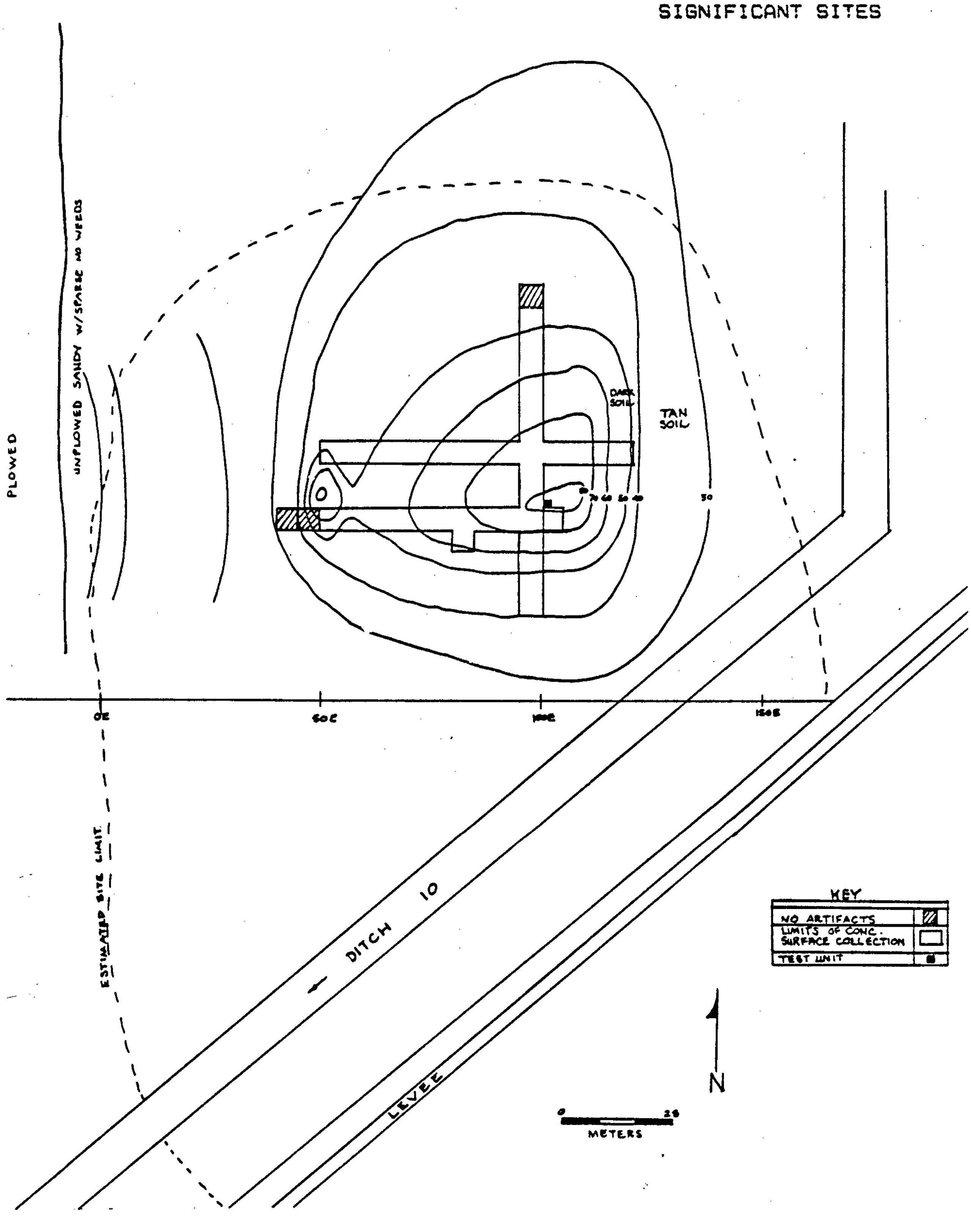

Figure B-8. 3MS471, Site Map.

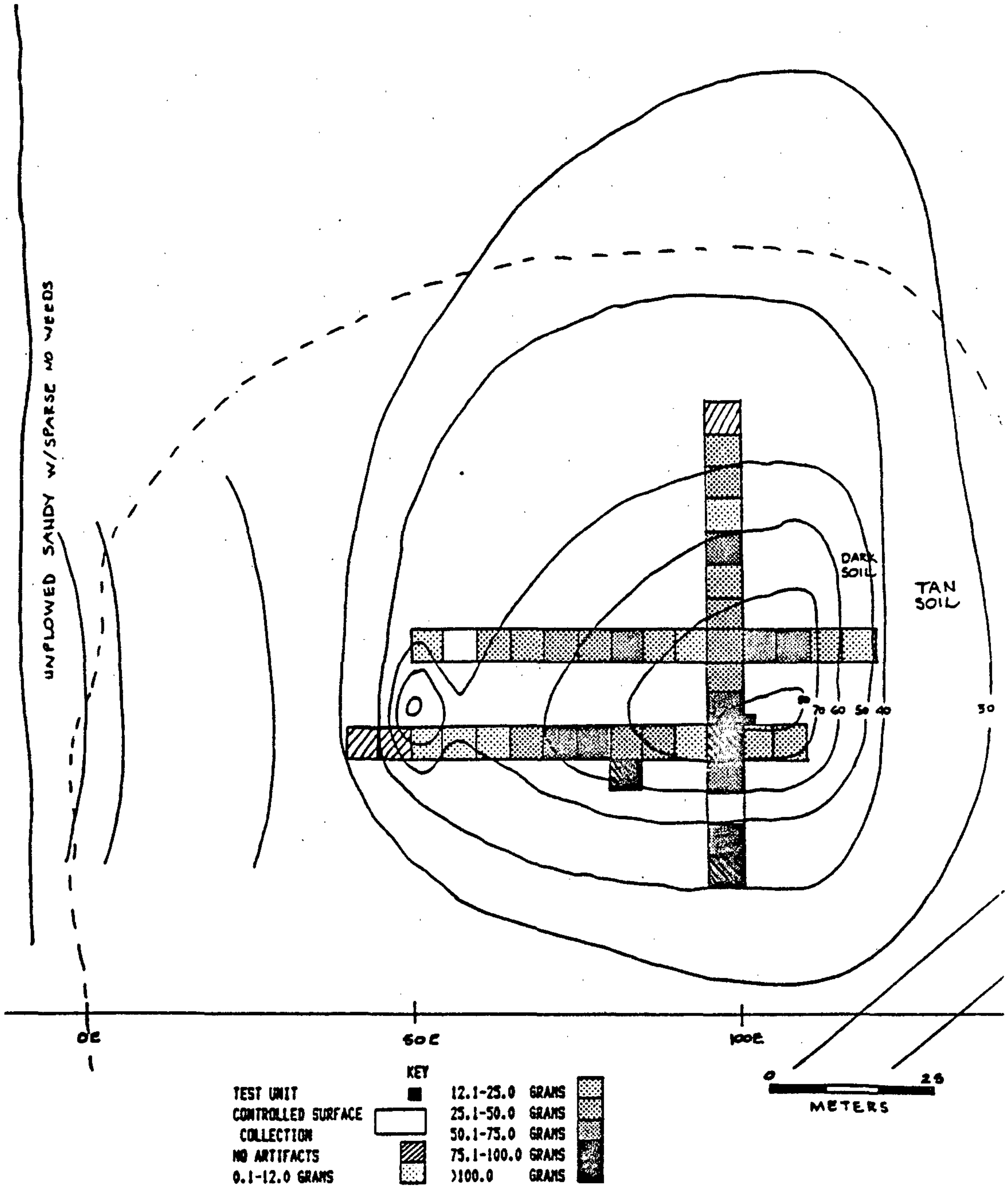

Figure B-9. 3MS471, CSC, Barnes Plain Ceramics (grams).

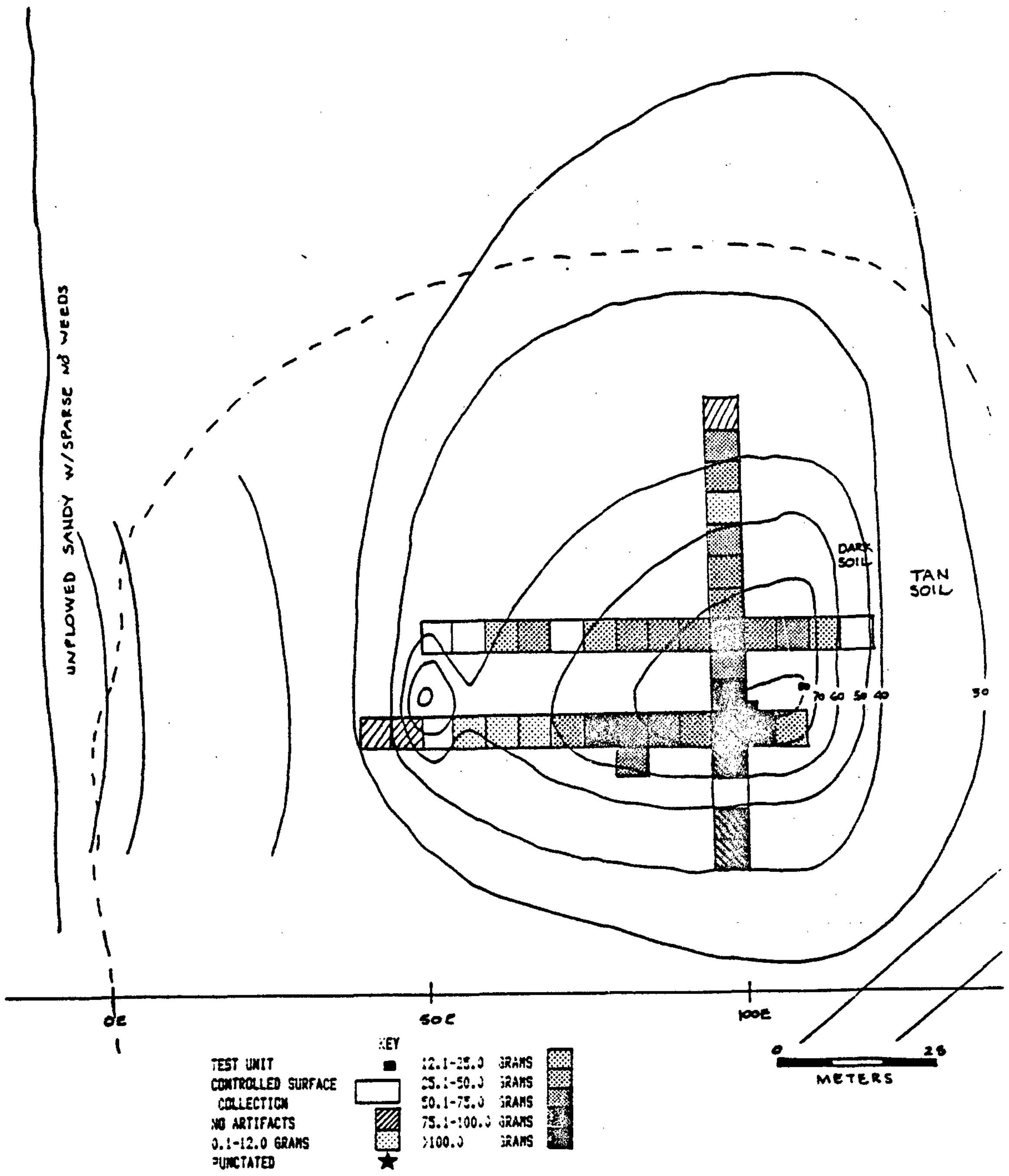

Figure B-10. 3MS471, CSC, Barnes Cordmarked Ceramics (grams).

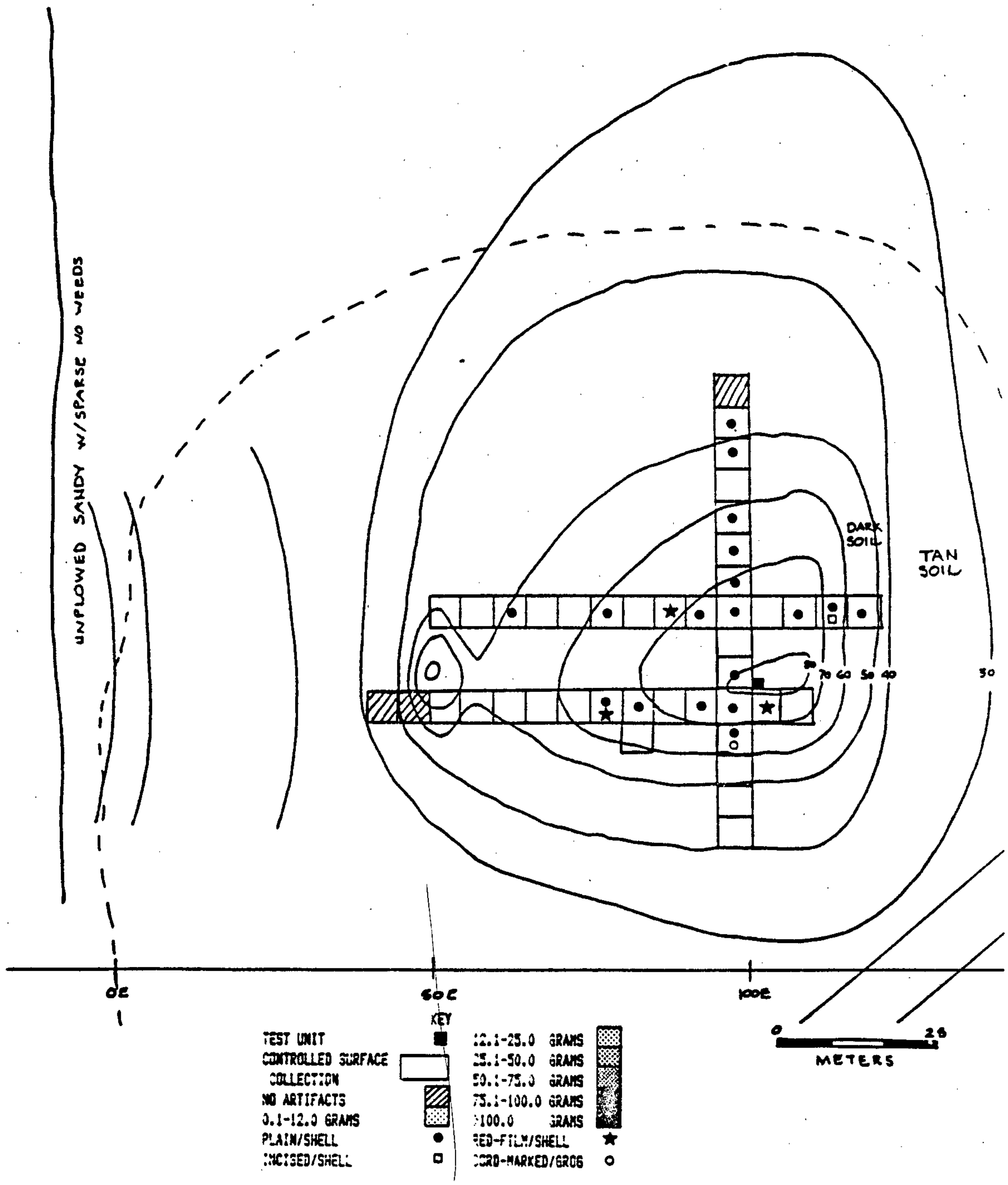

Figure B-11. 3MS471, CSC, Shell-tempered Ceramics (grams)

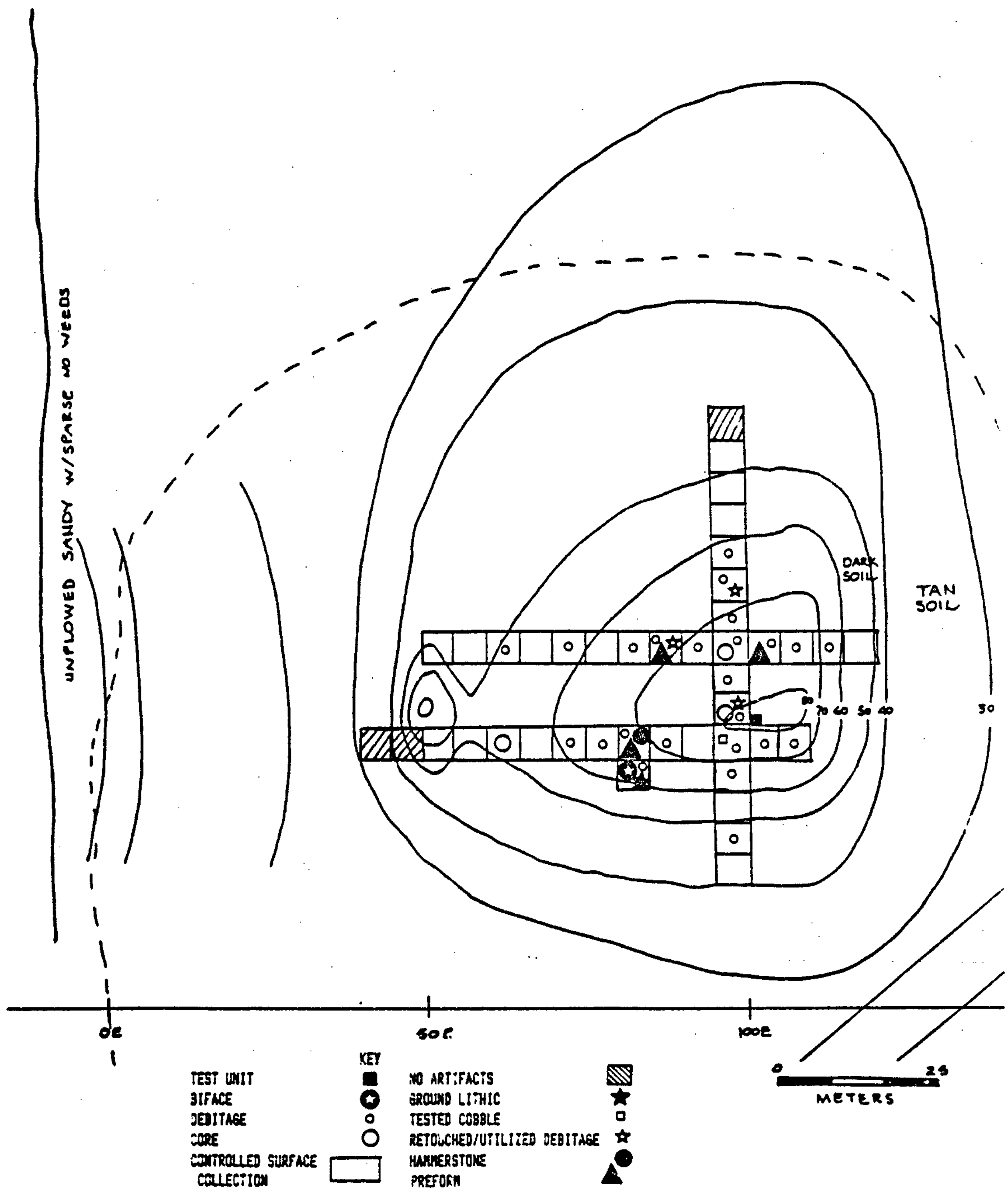

Figure B-12. 3MS471, CSC, Prehistoric lithics (less than 12 artifacts per unit).

Controlled Surface Collection: At the time the controlled surface collection was made the edges of the site as observed during the excavation of the test unit were under water. Consequently, it was impossible to define the site limits on the basis of the CSC.

Barnes sherds were found over the whole central part of the site with concentrations of Barnes Plain at 75E and 100E (Figure B-9). There were heavier densities of Barnes Cordmarked ceramics (Figure B-10) at the lower elevations than of Barnes Plain ceramics. This probably corresponds to the greater densities of these ceramics in the lower parts of the site. This implies that the lower component of the site is being eroded along the site flanks.

The Mississippian pottery had a more restricted distribution concentrated on the highest part of the site (Figure B-11). Several sherds of Varney Red Filmed suggest that this is an early Mississippian occupation. These were found in much lower density than the Woodland sherds.

The lithics recovered were in greater density than in the collection from 3MS199. For a lowland site located scores of miles from the nearest source of lithics there was a high density of cores and tested cobbles and hammerstones. Two Mill Creek hoe flakes and one Dover chert adze were recovered. These may have important chronological/technological implications (see Chapter 8).

Test Unit 1 was excavated at 200N100E on the top of the site (Figure B-8). The upper plowzone (0-15 cm BS; Figures B-13 and B-14) was removed as a single unit (Table B-6). A deeper plowzone extended to 25cm, roughly coinciding with the bottom of the excavation level. Both of these were a homogeneous dark yellowish brown sandy silt. The plowzone was underlain by a very dark grayish brown sandy silt occupation zone which was as deep as 50cm below surface in the bottom of the features. Gray mottles began in this level and extended in increasing density to the bottom of the excavation unit. The occupation zone was underlain by a yellowish brown clayey silt with some sand and with many gray mottles, some of which were apparently crawfish holes extending to at least 70cm below surface.

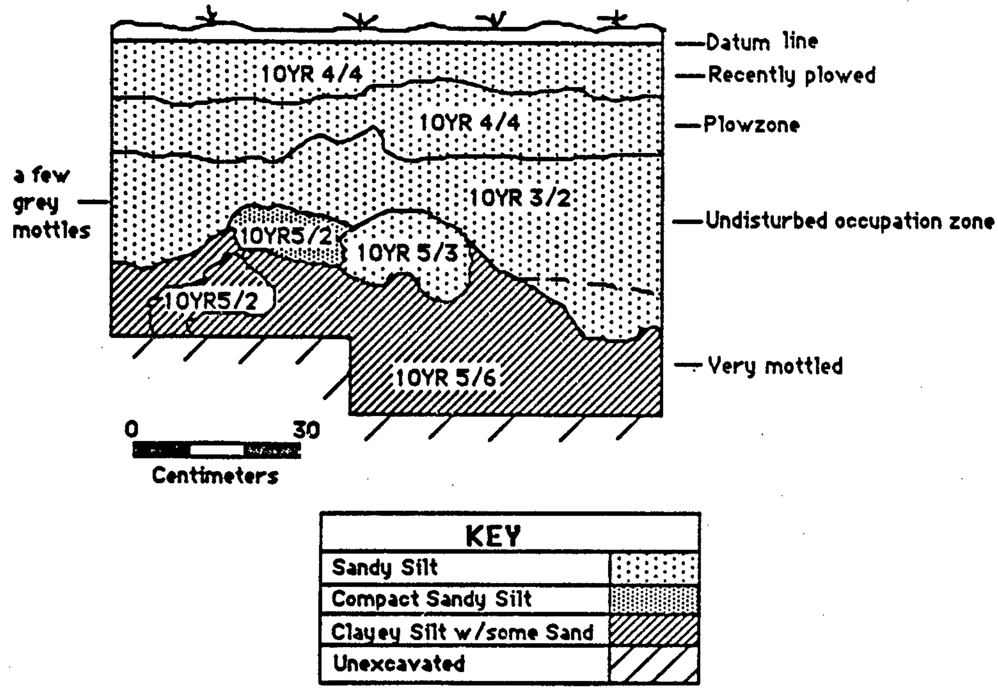

Figure B-13. 3MS471, Test Unit 1, East Profile

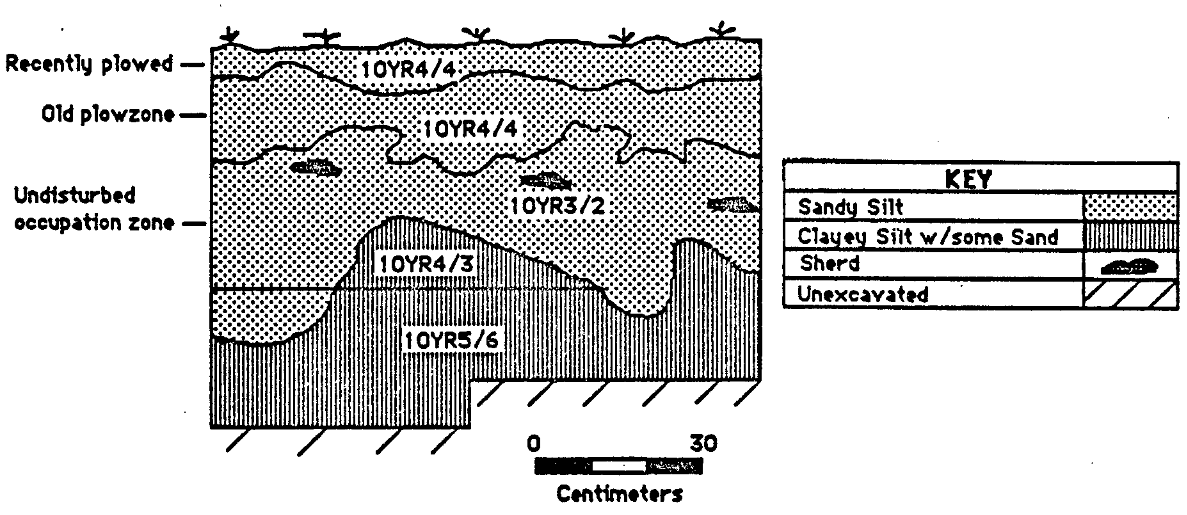

Figure B-14. 3MS471, Test Unit 1, South Profile

Table B-2 presents the artifacts recovered in Test Unit 1. Historic material was recovered only in the plowzone and consisted of glass and other miscellaneous artifacts. Mississippian ceramics were restricted to the upper 25cm of the test unit and were in comparatively low density. The greater density of cordmarked pottery in the lower levels is quite apparent in this test unit, especially when the weights are used as the basis for the density computations. Below 45cm the density of material drops to nearly nothing and the small sherd size suggests that these may have worked their way downwards naturally or have been associated with the slightly deeper stain observed in the west end of the South Profile.

Table B-2. 3MS471, Test Unit 1, Prehistoric ceramics and other selected artifacts (grams)

	Historic		Temper	Barnes			Daub	Flakes
Depth Cm BS.	Sherd	Metal	Shell	Plain	Cdmkd.	Dec.		
0-15	1.9	77.3	3.6	319.8	139.9	6.5	18.9	1.8
15-25			5.2	139.4	185.1	90.2	58.0	
25-35				144.2	461.5	60.0	116.0	
35-45				8.0	48.0			0.1
45-55				3.5	8.5			
55-65								
65-75								
Total	1.9	77.3	8.8	614.9	843.0	156.7	194.9	1.9

Historic Documentation

Historic Maps: A historic house site is shown on the 1945 USGS quad at this location.

Archival Documentation: Matthews and Whitaker owned 3MS471 along with 3MS199, 3MS119, 3MS21 and 3MS472 until the early 20th century (see Archival Documentation for 3MS199 for this history). When the logging boom reached the area in the early 1900s, the Buckeye Lumber Company bought a great deal of land in Mississippi County. Matthews & Whitaker sold 3MS471 to Buckeye Lumber in about 1905 (Mississippi County Real Estate Tax Records, Osceola 1905). Once the timber was cut from a parcel of land, the lumber company would sell it, usually to a farmer. In this case T.A. Neal owned the land by 1913, but probably lost it for not paying a mortgage. In 1925 the Bank of Hornersville, Missouri, transferred the land to W.W. Langdon (Mississippi County Real Estate Tax Record, Blytheville 1913, 1925, 1940).

Proposed Site Function and Cultural Affiliations

The historic component is obviously a domestic farmstead. The restricted size of the Mississippian component, arrow points, and hoe fragments all suggest a farmstead. The larger area with Barnes pottery suggests a more intensive use during the Woodland period; either more people living there or occupation for a longer period of time. The differences in surface treatment of the pottery indicates that a long part of the Woodland period is represented in the assemblage. Again there is the low density occurrence of grog-tempered pottery that needs to be explained. The range of lithics present on this site indicates a generalized occupation site.

Management Department

Data Limitations: The surface limits of the site have not been fully defined by controlled surface collection. Due to the flooding of the seep ditch, none of the edges have been defined by the controlled surface collection. We have even less knowledge of the subsurface extent of the site and what variation is present in site depth.

Proposed Impacts: This site is currently cut by Ditch 10 and will have a much larger area excavated on the east side where the levee is located.

CRM Recommendations: (1) More extensive testing to define site limits and to document more fully artifact variation and surface limit, (2) Route project around the site , or, (3) cancel this section of the project.

SITE 3MS119

Description

Period/Time: Early Mississippian, Barnes, Historic Tenant(?) House

Estimated Site Area: >6 ha

CSC (Square meters): 2,050

Maximum known depth: >85 cm BS

Nature: This is a dense scatter of prehistoric and historic material on a well drained sand ridge composed of Dundee Silt Loam (Ferguson and Gray 1971:Sheet 2). One standing house is still occupied and two locations look like previous house sites. This site is located on both sides of the ditch. The test unit was excavated to 85cm below surface where excavation was terminated due to objections of the landowner. At this level we had just identified a post mold or small pit with Varney Red Film sherds. The matrix we had been digging through was a Woodland period midden. This site covers a much greater area than originally reported. We currently have good data on the southern limits of the site and no other areas. Mr. Ray Benefeld, who grew up in the house on the site and as a boy collected points from its surface, stated that he had picked points up as far north as the fence, indicated that most of his large points came from a steep slope which appears to correspond to the old levee slope, and asked whether we thought that the area east of the ditch with a lot of white chert was prehistoric. Investigations of this area (Figure B-16) indicated that it was a relatively dense concentration of Crescent quarry lithic debris. The author visited Mr. Benefeld's house and looked at his point collections. Mr. Benefeld identified one board of points found by his brother which he was sure had come only from 3MS119. This board contained at least three Dalton points, 20-30 Archaic points, and a few arrow points.

Methods of Testing and Results

This site was tested with a general surface collection, a controlled surface collection and one test unit.

General Surface Collection The general select collection produced a range of artifacts not unlike the ones recovered on the CSC, with the exception of lithics, emphasized in this collection, due to their low density on the site in general, except for the northeast part of the site.

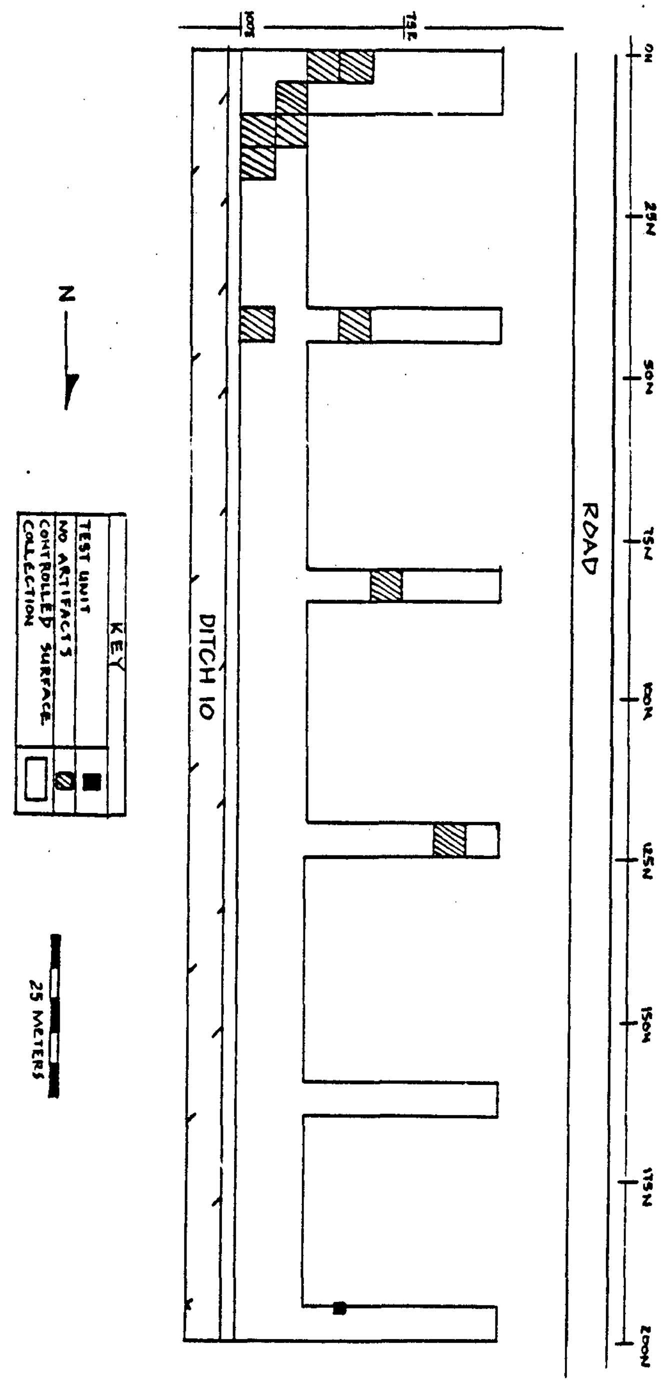

Figure B-15. 3MS119, Map of South Part of the Site.

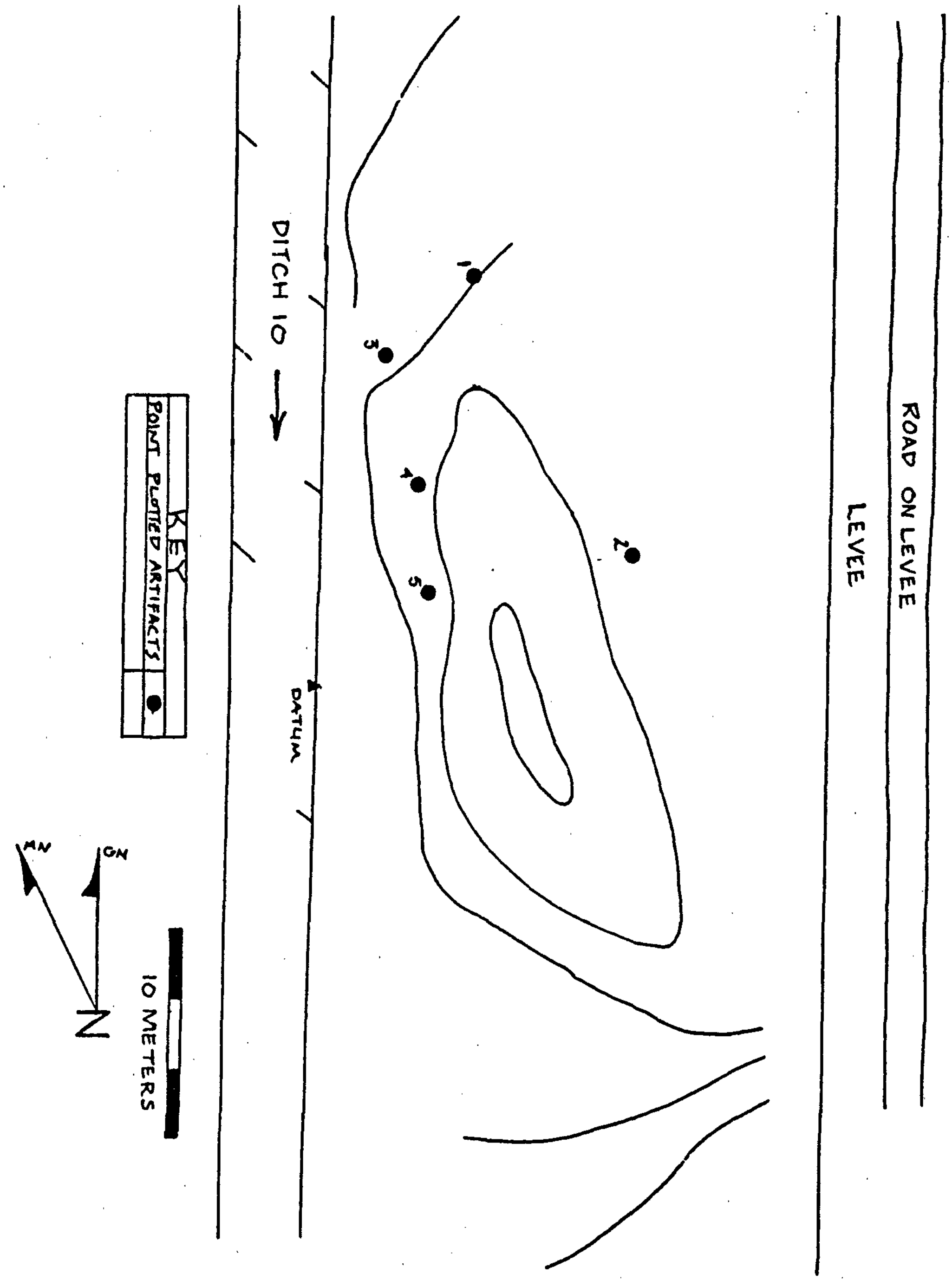

Figure B-16. 3MS119, Point Plotted Lithics on the Northeast Part of the Site.

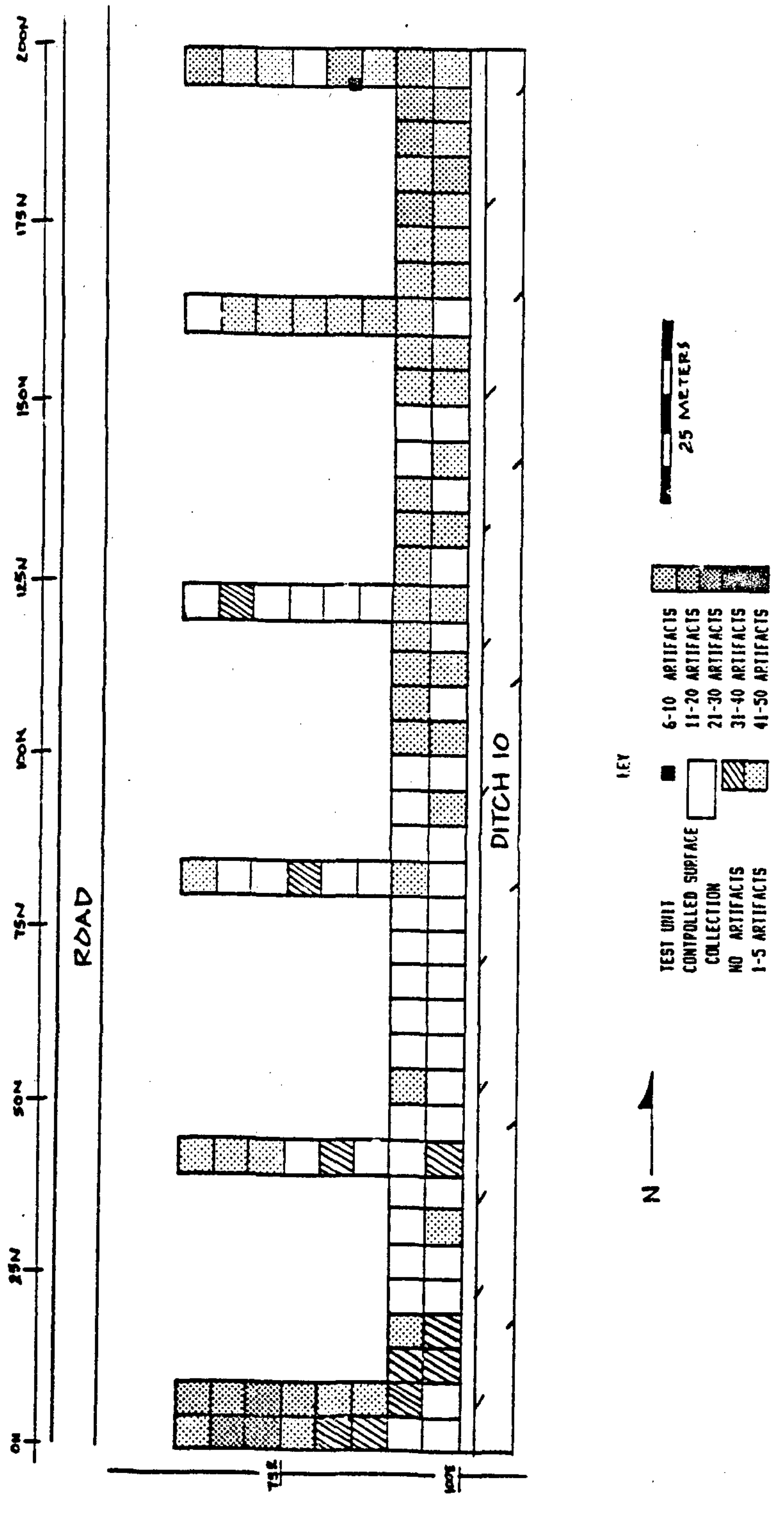

Figure B-17. 3MS119, CSC, Historic Sherds.

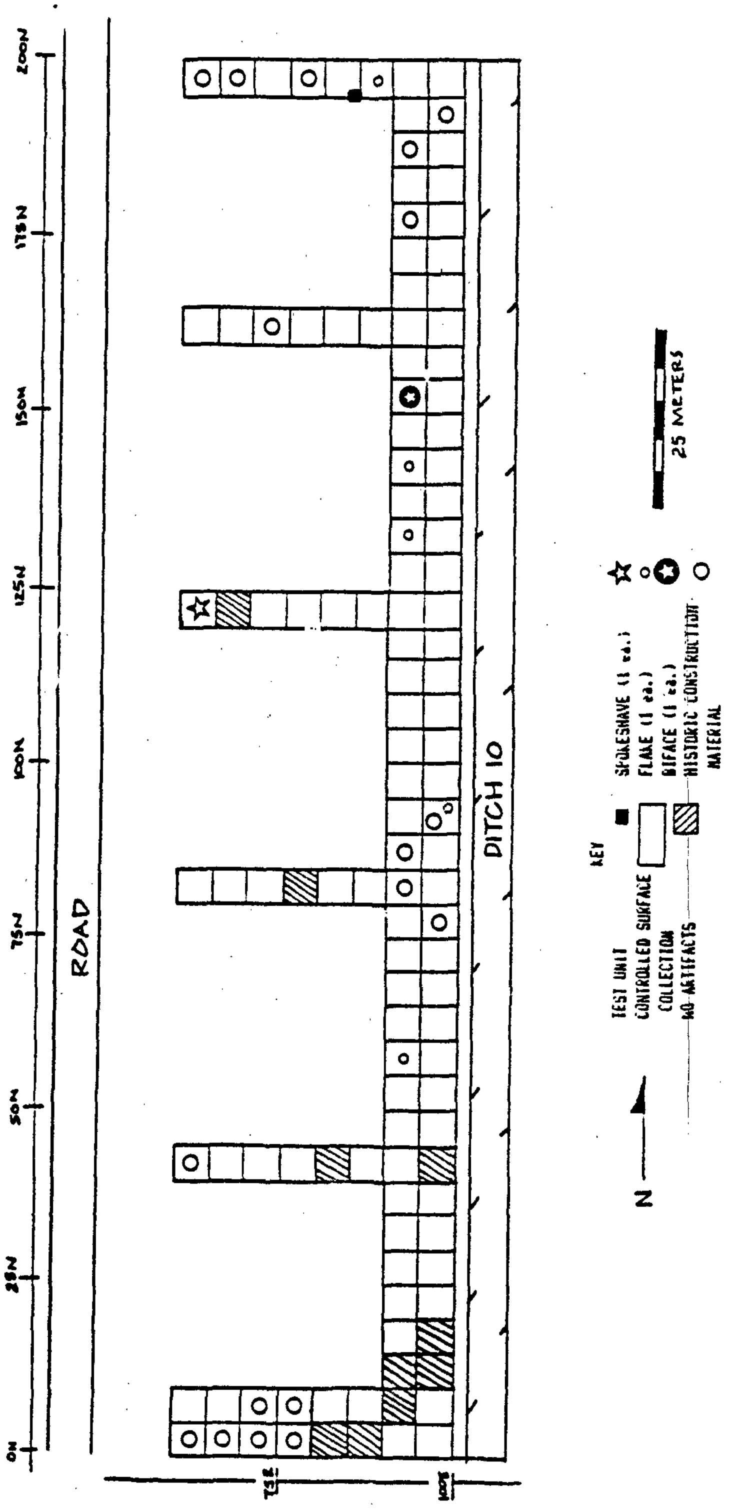

Figure B-18. 3MS119, CSC, Historic Construction Materials. and Prehistoric Lithics.

<u>Controlled Surface Collection</u> The CSC was laid out parallel to the ditch with transects out toward the road. There were two concentrations of historic sherds at the extremes of the CSC (Figure 7). The south one was at a location where a house was shown on the 1945 Manila Quadrangle, and the north one was associated with the standing house just north of the collection area. Interestingly, the south concentration had relatively high and specific historic construction material, while the north one had much more diffuse and lower concentrations of these materials. The south area was almost mutually exclusive with regard to the prehistoric component.

The highest density of materials was Barnes Plain pottery followed by Barnes Cordmarked pottery (Figures B-19 and B-20). There were three concentrations of Barnes Plain pottery at 50N, 100N and 150N near the ditch. The latter more or less corresponded with the one concentration of Barnes Cordmarked pottery. The limit of the south edge of the distribution of the Barnes component(s) is well defined in the CSC; however, the southern historic component is not.

The Mississippian component delineated by the CSC (Figure 21) is concentrated on the north end of the site. Our impression from the initial survey is that the Mississippian component is located principally to the north of Mr. Benefield's house. When we were testing the site we did not conduct a CSC in this area because it had been mounded up recently to plant cotton, and the artifact visibility in this dusty field was negligible. One Red Filmed sherd was recovered, suggesting an Early Mississippian component.

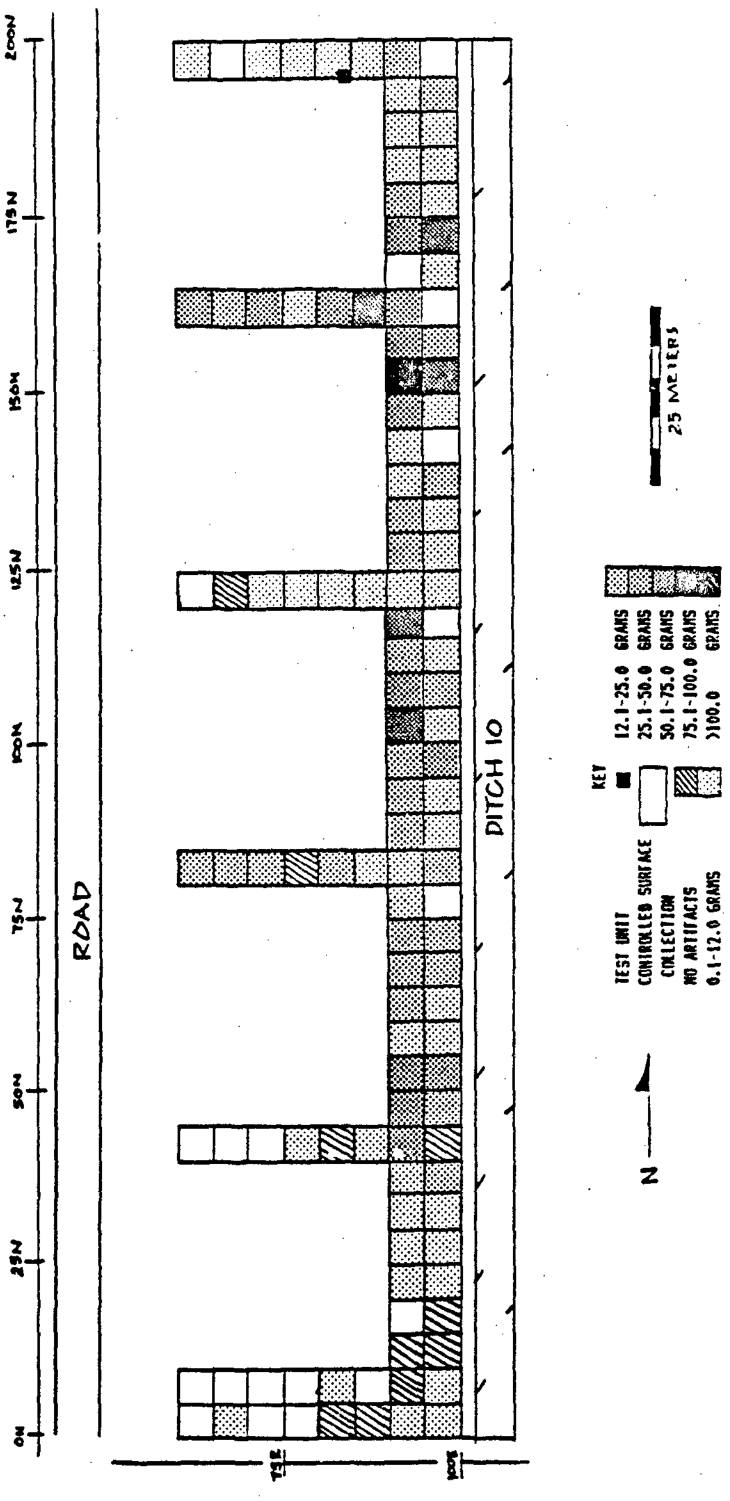

Figure B-19. 3MS119, CSC, Barnes Plain Pottery (grams)

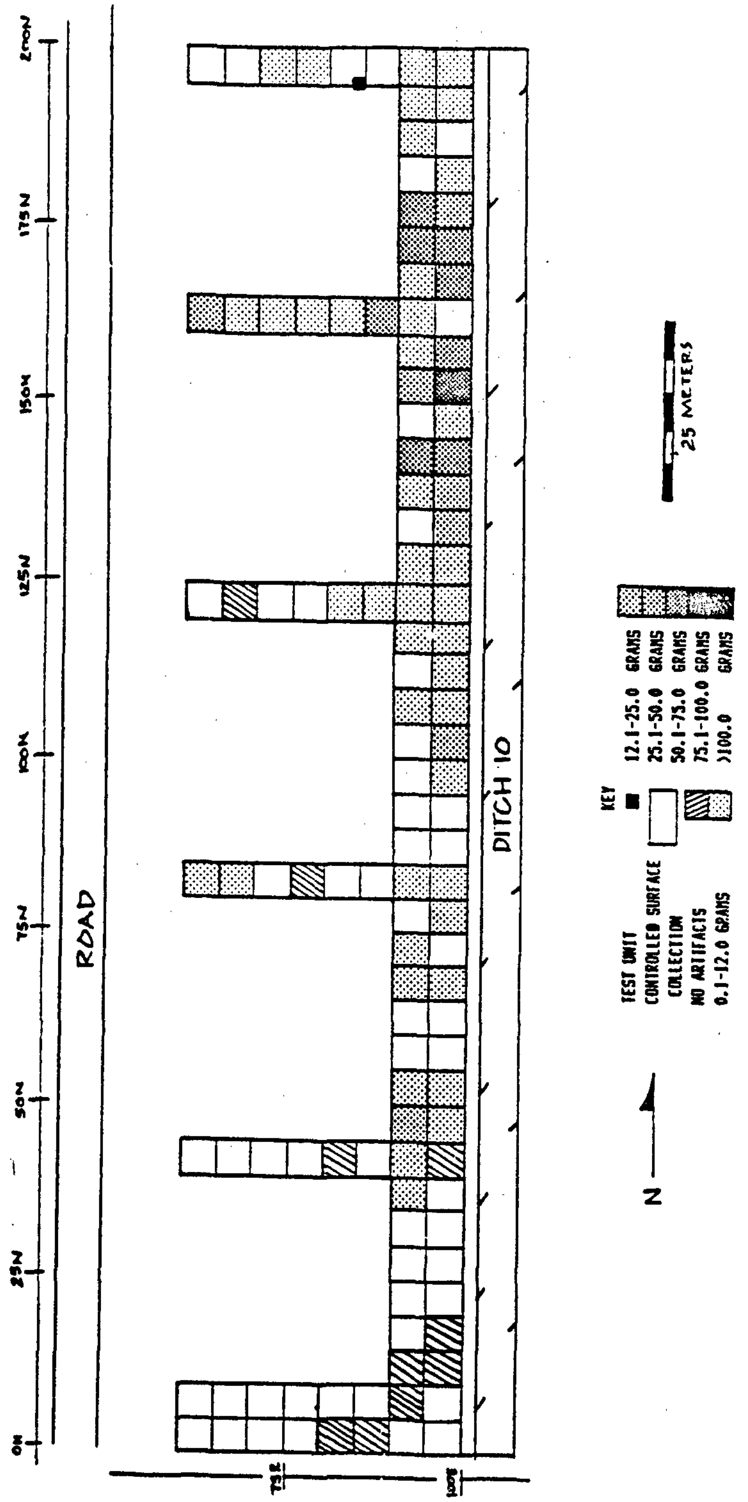

Figure B-20. 3MS119, CSC, Barnes Cordmarked and Decorated Weathered Sand Tempered Pottery (grams)

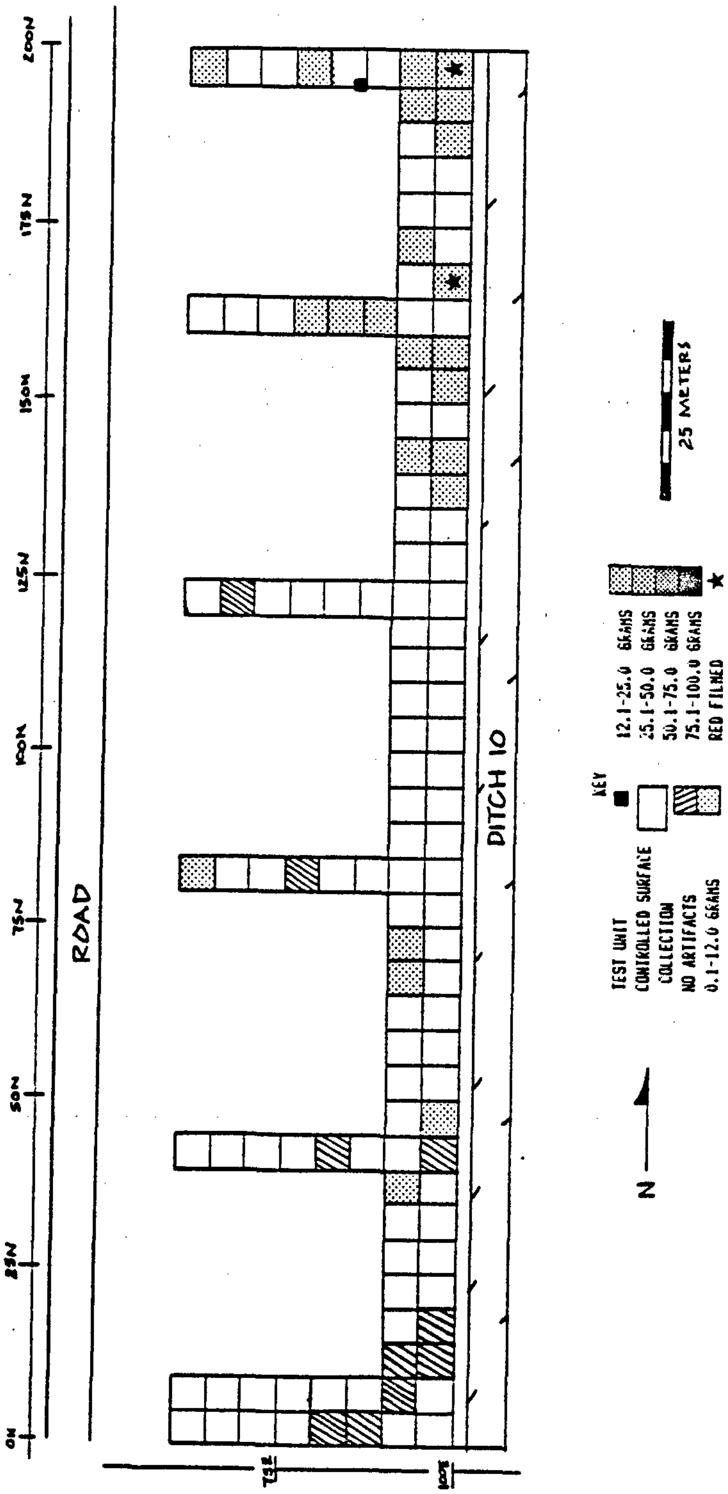

Figure B-21. 3MS119, CSC, Shell tempered Pottery (Grams).

Test Unit 1 was excavated at 195N85E (Figure B-15) to a depth of 80cm BS (Figure B-22). The plowzone was composed of a dark brown sand and extended to 29cm BS. There were siltation bands across the bottom that contrasted starkly with the very dark grayish brown silty loam midden. At this juncture the artifact content increased dramatically (Table B-3). The midden was 20cm thick. The artifacts in the last three excavation levels came predominantly and noticeably during excavation from a large postmold or feature which extended to at least the bottom of the excavation unit with brown silty loam. Investigations of this feature and the test unit ceased due to rain and a misunderstanding with the property owner.

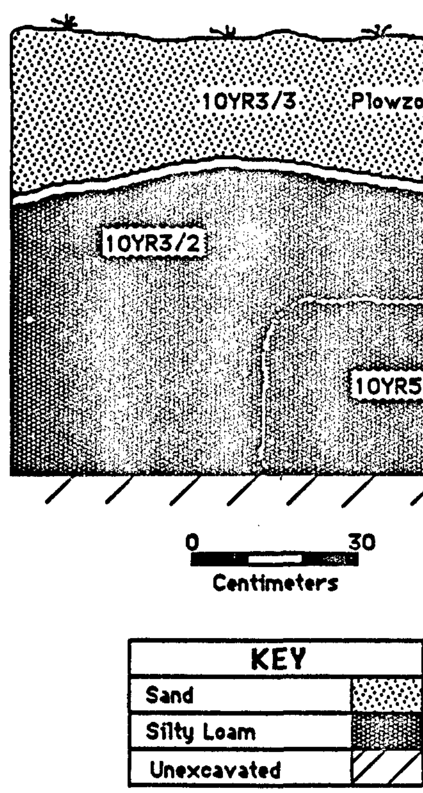

Figure B-22. 3MS119, Test Unit 1, South Profile.

The artifacts recovered from this test unit are shown in Table B-3. The stratigraphy is not so clearly delineated in this site because the large post mold/feature introduced Mississippian pottery into the lower Woodland levels. The percentage of Red-Filmed pottery is between 10-30% of the total shell-tempered sherds. These proportions are similar to the densities reported for the Zebree site, and the fact that the Red-Filmed sherds are in greater density and proportion than in the plowzone suggests that there may in fact be more than one Mississippian component present. As with the two sites reported above, there is increasing density and proportion of Barnes Cordmarked pottery with increasing depth. Of some interest from a preservation point of view is the greater size of sherds below the plowzone. We believe that the base of the midden is ca. 50cm BS as represented by the color change in the profile.

Table B-3. 3MS119, Test Unit 1, Prehistoric Ceramics and other selected artifacts (grams)

Depth Cm BS.	Historic Sherd	Historic Metal	Missip. Plain	Missip. Red. Film.	Barnes Plain	Barnes Cdmkd.	Dec.	Daub	Flakes
0-20	32.9	23.2	3.5		69.8	3.1			
20-30	3.2	23.6	21.3	2.4	52.2	26.5			
30-40	.3		39.6	12.4	44.8	64.8		15.6	
40-50			18.2	3.5	30.4	81.4			
50-60			9.2	5.6	7.3	19.2		23.0	
60-70			20.0	5.7	11.6			2.5	
70-80			1.0		.4	8.2			
Total	36.4	46.8	112.8	29.6	216.5	203.2	---	41.1	---

Historic Documentation

Historic Maps: Structures are shown on the 1945 USGS quad maps, where the house is still standing north of the CSC area, and another is shown at the south end of the site around the concentration of historic material at the south end of the site (between 0-75N in the CSC).

Archival Documentation: Matthews & Whitaker owned 3MS119 (see Archival Documentation of 3MS199 for this discussion) until about 1905 when it went to A.E. Marshall (Mississippi County Real Estate Tax Records, Osceola 1905). The property went to the Buckeye Lumber Company by 1908. By 1913 it had been purchased by

W.W. Brewer; going to L.A. Brewer, probably an heir, in about 1930 (Mississippi County Real Estate Tax Records, Blytheville 1908-1940).

Proposed Site Function and Cultural Affiliations

This site has components which range in time from Woodland, Mississippian and historic times. The range of prehistoric materials and density suggests at least four prehistoric components and buried intact midden deposits. The wide range of lithic tools indicates that this was an occupation site. The reported Archaic and Dalton points from the northwest end of the site suggest that there are likely to be some deeply buried earlier Archaic components present on part of the site.

Management Department

NRHP Significance: This site is perhaps the most significant of the four large sites discussed in this section. The site has features, and a rich midden. We were into the Early Woodland levels, as evidenced by Poverty Point Objects, when excavations had to be halted. This is apparently a stratified deposit which is extremely important for defining cultural change and continuity in the Central Mississippi River Valley.

Data Limitations: The surface limits of the site have not been defined fully by controlled surface collection. We have even less understanding of the subsurface extent of the site and what variation is present in site depth.

Proposed Impacts: This site is currently cut by Ditch 10 and will have a much larger area excavated on the east side, where the levee is located.

CRM Recommendations: (1) More extensive testing to define site limits and to document artifact variation and surface limit, (2) Route project around the site, or, (3) cancel this section of the project.

SITE 3MS21

Description

Period/Time: Historic, Early Woodland, Middle Woodland, Dunklin Phase, Baytown (?), Early Mississippian

Estimated Site Area: >3 ha

CSC (Square meters): 3,550

Maximum known depth: >125 cm BS

Nature: This site contained a mound reported southwest of the house site. There was a scatter of sherds and lithics on the sandy ridge running north to south and on both sides of Ditch 10. The soils at this location are recorded as being Routon-Dundee-Crevasee Complex (Ferguson and Gray 1971:Sheet 2) Our field observations suggest that on the sandy ridge it is one of the latter (Chapters 3 and 5). Two pots were reported to have been dug out near Ditch 10 on the ridge in the 1960s. The historic house site probably has some antiquity. Two test units were excavated on this site on both sides of the ditch. Test Unit 1 on the west side contained a stratified sequence of three paleosols, separated by white sand. This terminated at 1m below surface in an assemblage which had cordmarked pottery and a mass of unfired Barnes clay body and Poverty Point Objects. Test Unit 2 on the east side of Ditch 10 had stratified deposits to 125cm when excavations were terminated due to the rising water table. Poverty Point Objects, daub of a large size and a fired clay hearth was recovered in this unit. A core was taken from the north part of this site, and what appeared to be coarse sands of the Relict Braided Surface were encountered at 2m BS.

Methods of Testing and Results

This site was tested with a general surface collection, a controlled surface collection and two test units. Two test units were excavated on this site to determine if the ditch had really cut the site as was suggested by the surface distribution of artifacts. This supposition was determined to be correct. We also determined on this site that the spoil pile had been placed on the east side of the seep ditches. This was confirmed south of this site in the woods survey, where the spoil pile had not been plowed down.

General Surface Collection: This produced most of the historic artifacts recovered on the site as the historic component was located to the northwest of the CSC, which had only 3 artifacts. The general collection produced a 1905 copper penny, a snuff bottle base and whiteware (Table C-7). The most common artifact type recovered was Barnes pottery.

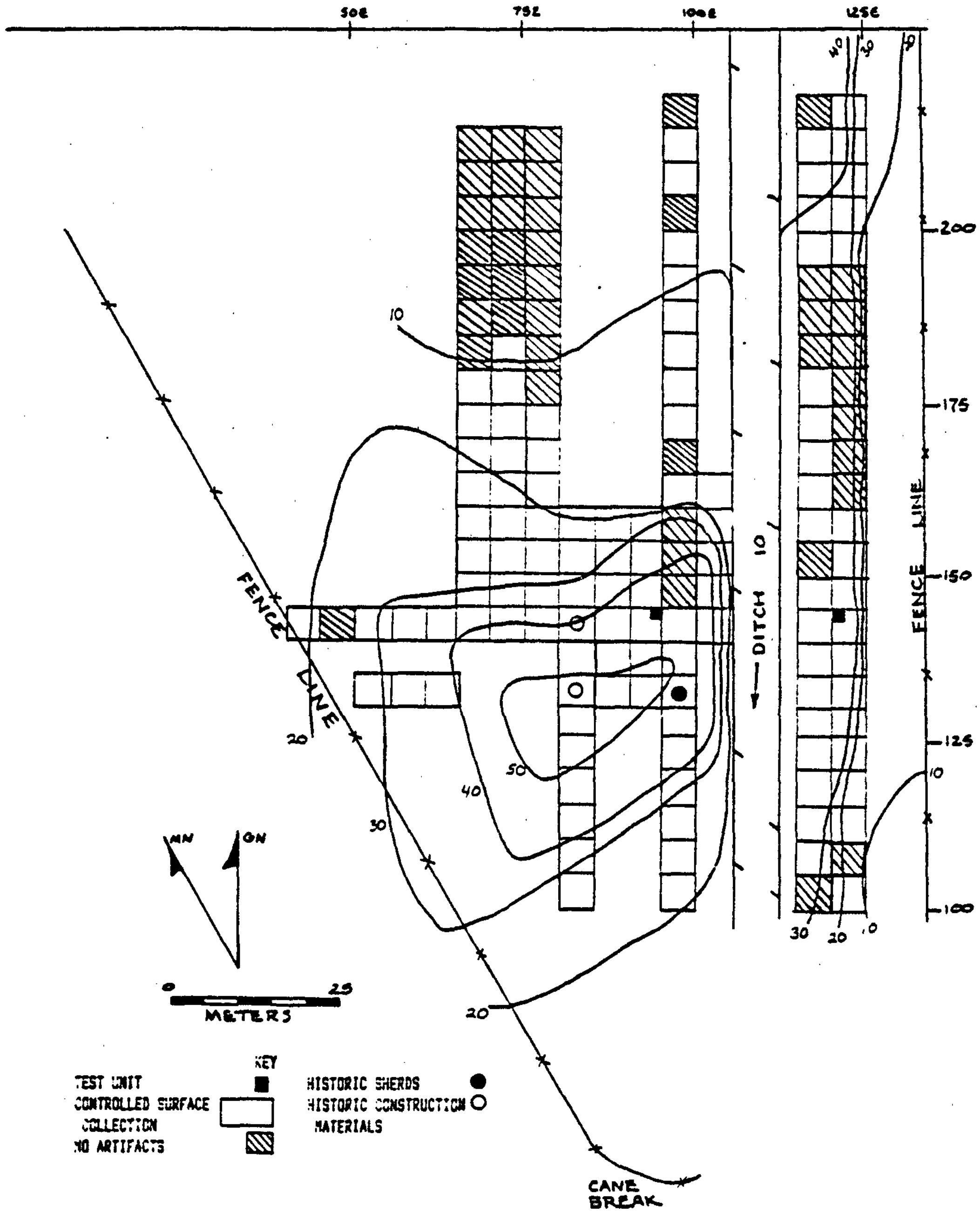

Figure B-23. 3MS21, Site Map and Historic Artifacts.

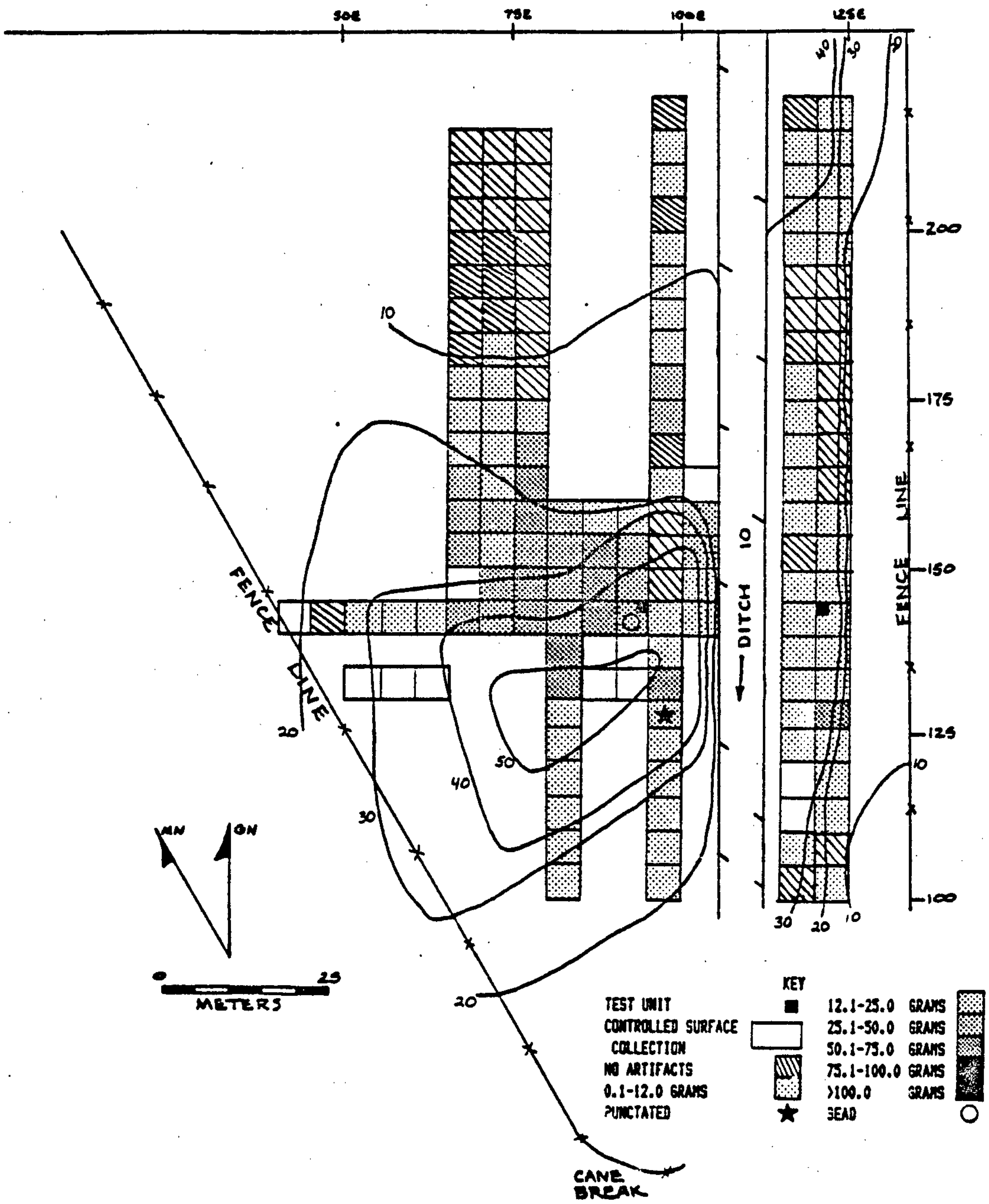

Figure B-24. 3MS21, CSC, Barnes Plain Pottery (grams)

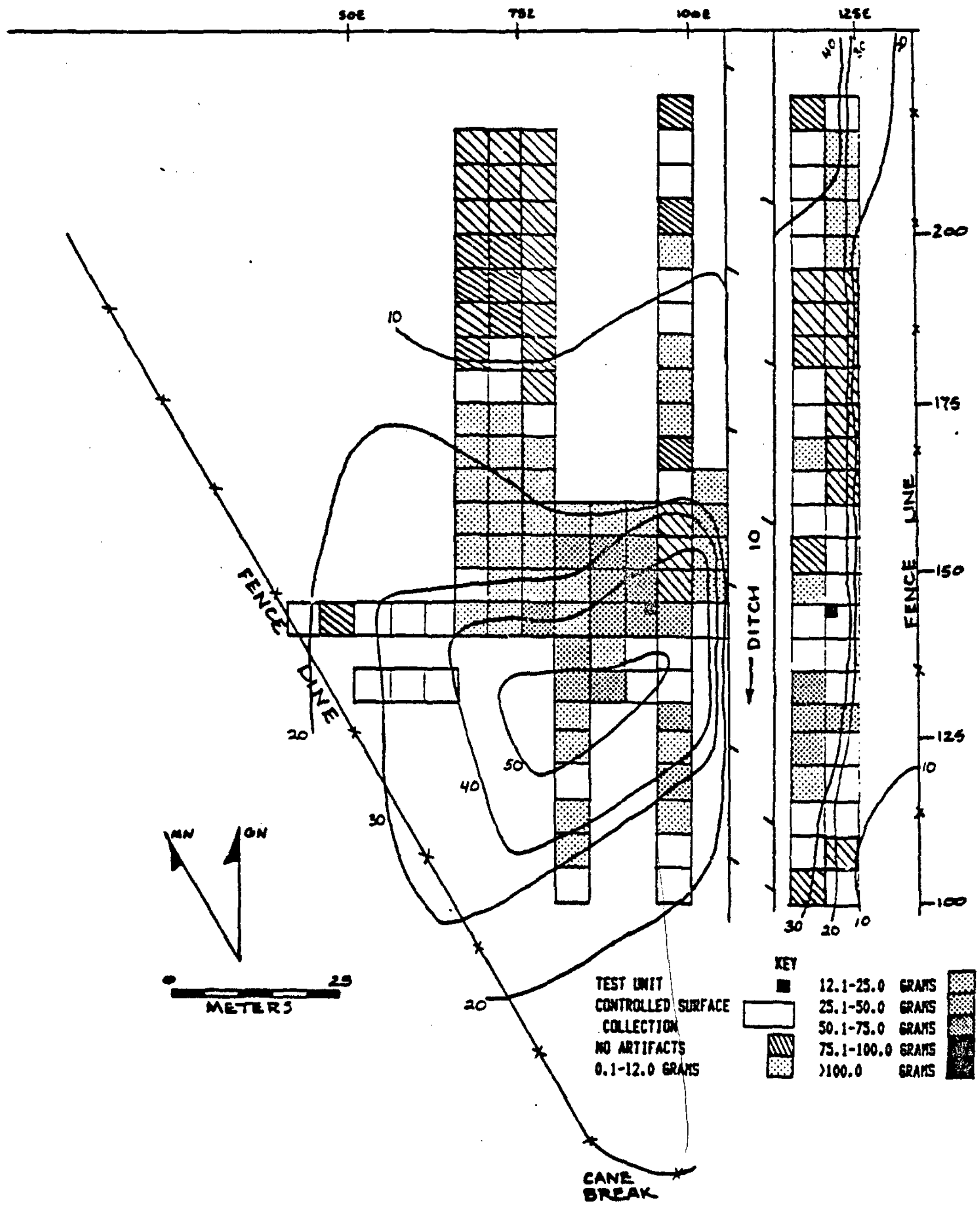

Figure B-25. 3MS21, CSC, Barnes Cordmarked Pottery (grams)

Controlled Surface Collection: The CSC was made on both sides of the ditch and concentrated on the 40cm-high knoll where the site was closest to the ditch. A light scatter of material extends to the northwest toward the reported mound location and toward the south into the next field. The area due north of the center of the site was low, sandy and wind-scoured, having the general appearance of a Bolson Desert. A few scattered sherds in extremely low density were present in this area.

The Barnes Plain pottery was the most common artifact type recovered in this collection (Figure B-24). This distribution was concentrated on the northern side of the knoll on the west side with a smaller concentration in the northeast part of the collection area. The Barnes Cordmarked pottery was concentrated along the northern edge of the knoll and at the southeast corner of its distribution. The latter, located in the collection units next to the ditch, is probably a result of dredging. One Barnes Plain bead was recovered in the CSC (Plate 8-H).

Grog-tempered pottery was in low frequency, as it was on the other three previously discussed sites. Several sherds were scattered apparently at random. Daub was somewhat concentrated toward the top of the little knoll (Figure B-26).

Shell-tempered pottery (Figure B-27) is randomly distributed with no apparent concentration. This is in rather low density. Some Red-filmed pottery is present.

The lithics recovered (Figure B-28) were concentrated or the knoll and mostly consisted of flakes. One Late Woodland point type was recovered (Morse and Morse 1983: 188-190).

In summary, the Controlled Surface Collection has documented the most intensely used part of the site and has defined the edges of the prehistoric component on the north side of the site. In the survey, prehistoric pottery was noted for another 200m south of the fence line on the southwest edge of the site. Although this was in low density, from what we now know about the subsurface characteristics of the sandy levee soils along the west edge of Big Lake Swamp, we believe that there may be substantial and important deposits in this area also.

Two Test Units were excavated to test this site (Figure B-23). Test Unit 1 was positioned on the west side on the evident rise and highest density of artifacts observed in the impact zone. Test Unit 2 was excavated on the east side of the ditch to determine if there were intact deposits on that side as implied by the artifacts on the surface.

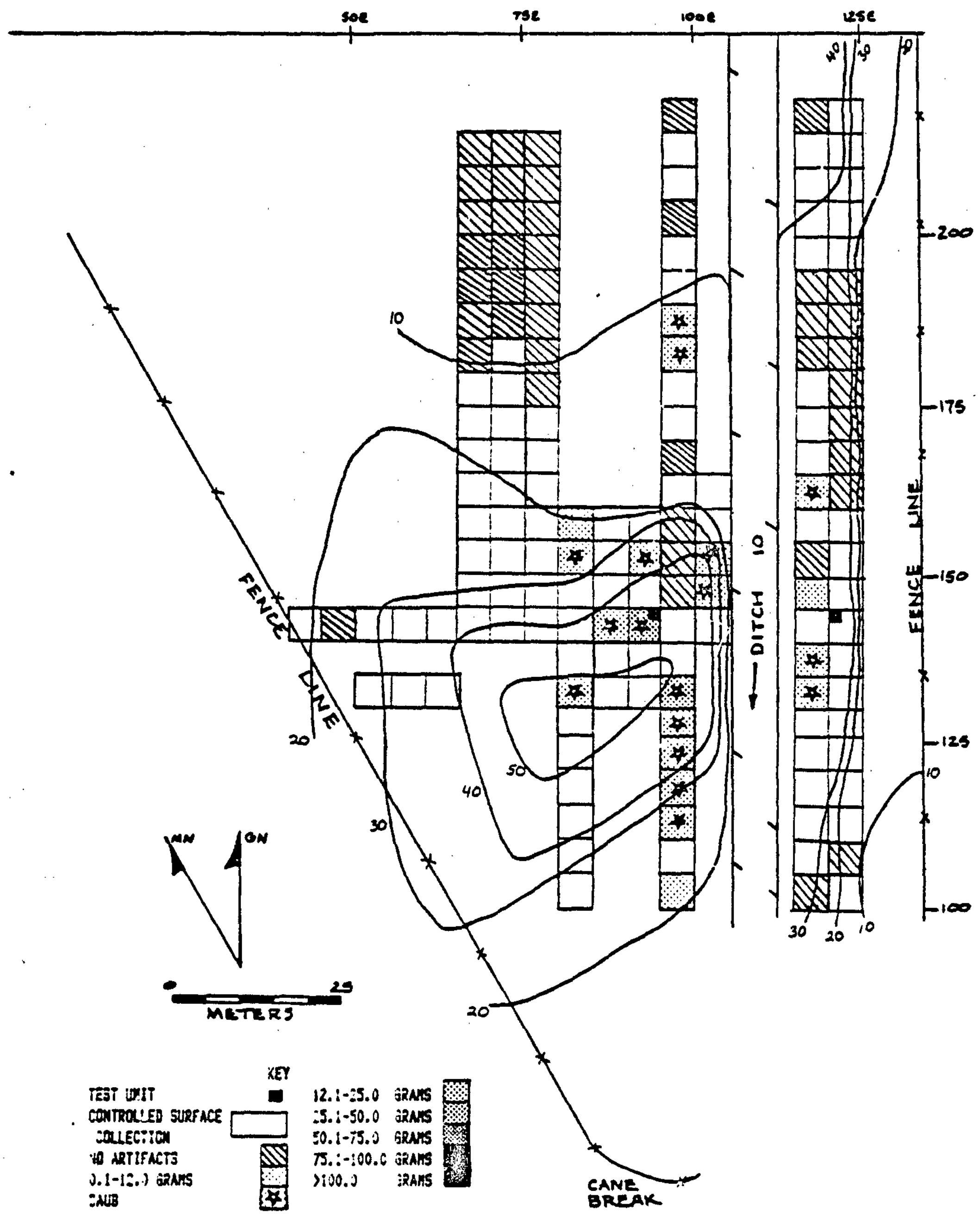

Figure B-26. 3MS21, CSC, Daub and Baytown Pottery.

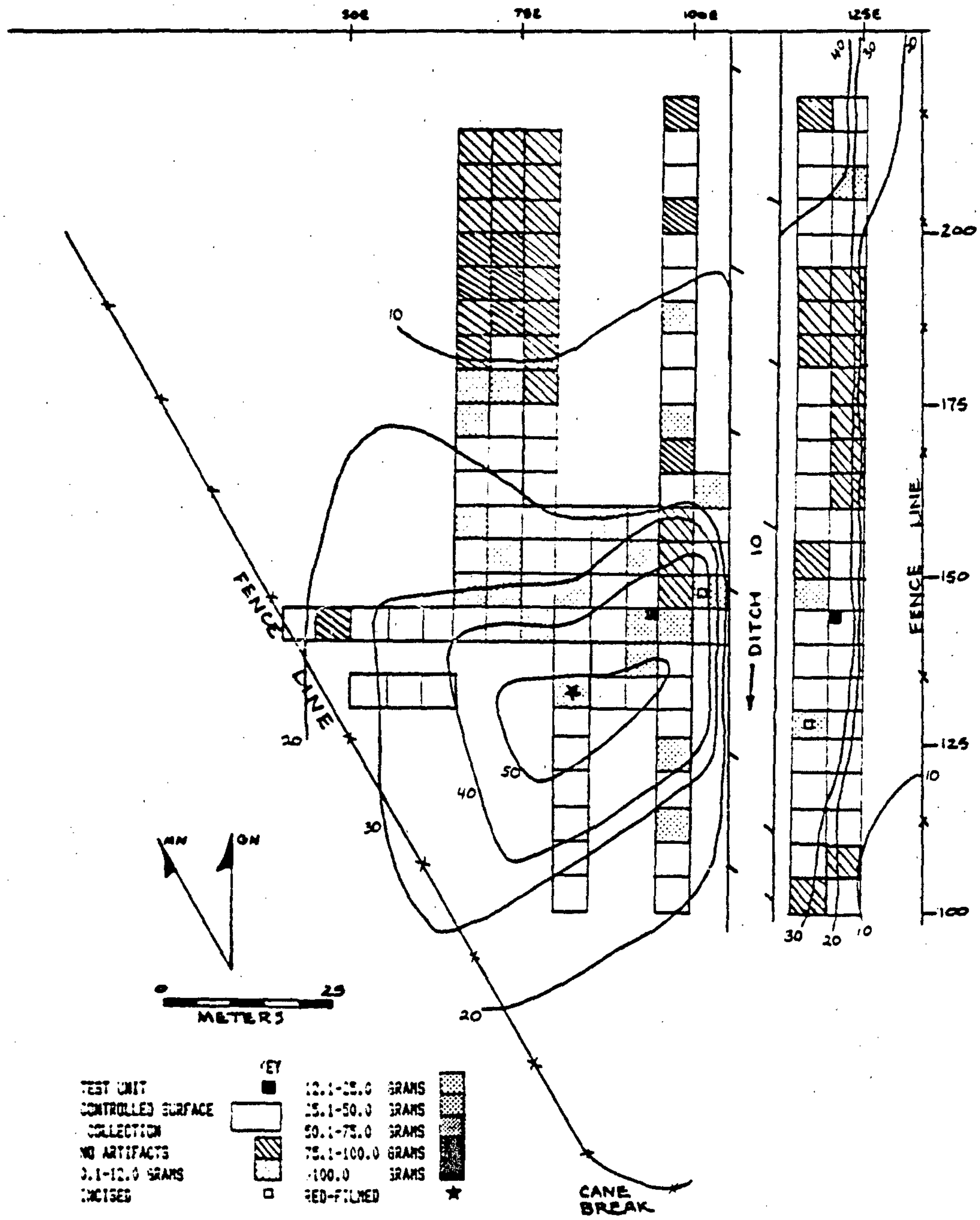

Figure B-27. 3MS21, CSC, Shell-tempered Pottery.

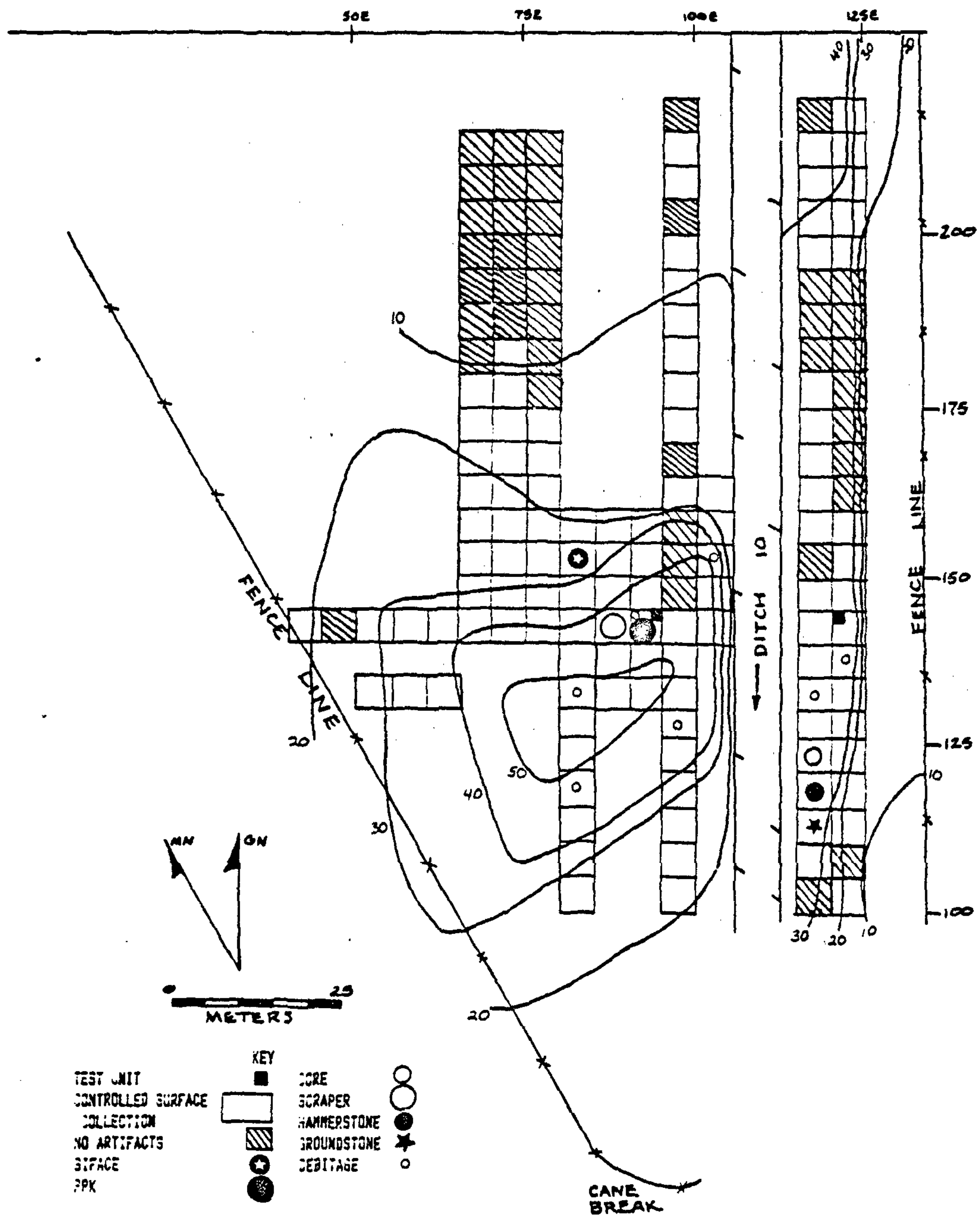

Figure B-28. 3MS21, CSC, Prehistoric Lithics.

Test Unit 1 was excavated at 144N94E in one of the highest density units in the CSC. This unit produced a ceramic bead and a projectile point. The unit was excavated to 100cm below surface (Figure B-29), where excavations were terminated due to ground water saturation. The dark yellowish brown sand plowzone extended to 25cm below surface. The base of this stratum was defined by plowscars and siltation bands over the dark brown sandy Barnes midden (M-I). This was 10cm thick and had a mass of orange clay and sand, which appeared to be unfired clay body for a Barnes pottery. The Barnes level overlay a 10-15cm-thick sterile dark yellowish brown sand level which overlay Midden level II between 50-60cm BS. This dark brown sandy level produced sand-tempered sherds. The third yellowish brown sand level was 30cm thick and again devoid of artifacts. We were preparing to draw and photograph the profiles and troweled a bit deeper on the pit floor. Dark soil again appeared. This was excavated through when another level of tan sand was encountered. This level contained sand-tempered sherds and biconical Poverty Point Objects. This was the top of the water table and excavations were discontinued. As with the other units described above, there was increasing mottling with increasing depth.

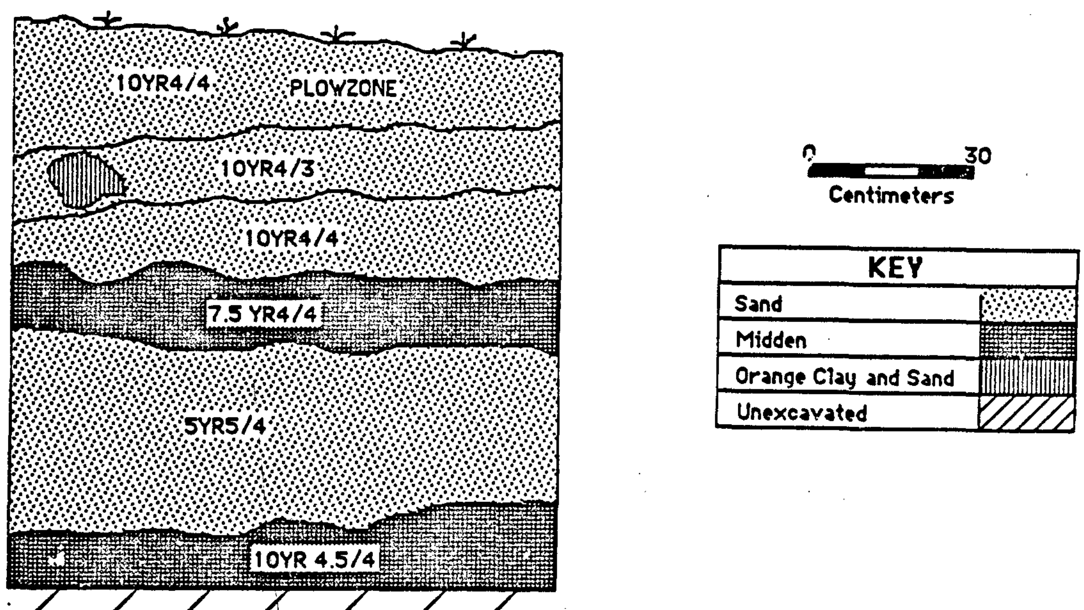

Figure B-29. 3MS21, Test Unit 1, South Profile.

The stratified nature of these deposits is also apparent in the distribution of the archeological materials. The Mississippian component is contained in the plowzone, which also contained the highest density of Barnes Plain pottery. The plowzone also had a number of sherds with mixed temper. Of some interest and importance is the presence of sherds with shell mixed with grog and/or sand temper. As with the other four sites previously discussed the cordmarking increases in proportion with increasing depth. A biconical Poverty Point Object was recovered between 50-60cm. Two sherds were recovered from 75-85cm. These strongly suggest either an Early Woodland component is present on this site or that these Poverty Point Objects extend into the Middle-late Woodland. The apparent depth of the stratigraphy leads me to believe that the former is the correct interpretation.

Table B-4. 3MS21, Test Unit 1, Prehistoric Ceramics and other selected artifacts (grams)

	Historic		Missip.		Barnes			Daub	Poverty Point
Depth Cm BS.	Sherd	Metal	Plain	Red. Film.	Plain	Cdmkd.	Dec.		Objec.
0-10			2.8		57.1	39.4		20.7	
10-20			6.2	2.0	95.2	61.4			
20-30		.6			54.2	126.5	86.4	24.5	
30-40					4.6	29.2	2.0	3.8	
40-50					6.2	10.6		32.1	
50-60					16.0		4.8		25.9
60-72									
72-85						24.4			
Total		.6	9.0	2.0	233.3	291.5	93.2	81.1	25.9

Test Unit 2 was excavated at 144N120E to a depth of 125cm BS (Figure B-30) where excavations were halted due to saturated ground water and a low density of artifacts. The 15cm-thick brown silty loam plowzone overlay a 10cm thick dark brown mottled zone which appeared to be intact spoil pile. Both of these zones produced low densities of small artifacts, including metal (Table B-4). From 25-45cm BS the soil became dark yellowish brown mottled sand and the artifacts increased in size and number. At 45cm we encountered plowscars from the pre-drainage-ditch era. From 45cm to the base of the excavation the soil was a dark brown silty loam and produced large sherds and flakes. Carbon was obvious throughout this unit and several Poverty Point Objects were recovered in the lower part of the unit. A large area of burned clay was uncovered at 105cm BS. This was pedestalled and left in place because we were not equipped to take archeomagnetic samples. This appeared to be in the center of a fairly large pit which bottomed out at 127cm below the ground surface. Excavation was discontinued at this depth because the soil was so saturated it was impossible to screen.

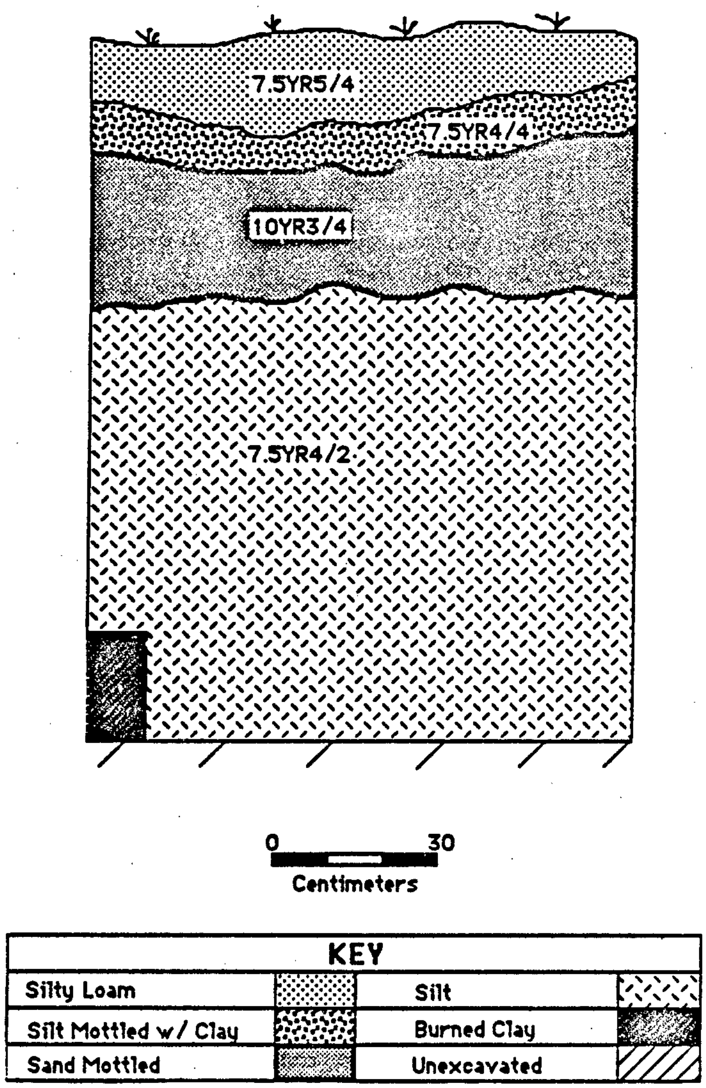

Figure B-30. 3MS21, Test Unit 2, South Profile.

This test unit produced artifacts in a distribution which reflected the stratigraphy in Test Unit 1 although the stratigraphy was not as clear in the profile. There may be 10cm of intact Mississippian deposits from 45-55cm below ground surface. However, it appears more likely that these were introduced from higher in the stratigraphy, especially given the high density of cordmarked Barnes pottery, and high density of Barnes Plain between 25-35cm BS. The same pattern of increasing density and proportion of cordmarked pottery with increasing depth is also present in this unit as with the other units previously discussed. This unit also produced sherds with mixed temper.

Table B-5. 3MS21, Test Unit 2, Prehistoric Ceramics and other selected artifacts (grams)

Depth Cm BS.	Historic Sherd	Historic Metal	Missip. Plain	Missip. Red. Film.	Barnes Plain	Barnes Cdmkd.	Sand & Shel	Daub	Flakes
0-09		1.9			15.7	6.3			
09-24			8.0		82.9	37.3		7.0	1.1
24-35			15.5	9.0	106.5	107.6	3.5	40.4	2.4
35-45			7.7		94.2	69.8		2.2	.8
45-55			9.0		57.3	211.2	3.2		.8
55-65			2.3		6.0	68.1		2.5	
65-75			1.1		10.3	47.8			
75-85					1.1	110.6		87.5	
85-95					8.1	29.0		2.9	.1
95-105					9.2	56.0		18.4	
105-115					.3	36.0			.1
115-125						10.8			
Total		1.9	43.6	9.0	391.6	1290.5	6.7	160.9	5.3

Historic Documentation

Historic Maps: The 1945 USGS Manila quadrangle shows a house on the north end of the site.

Archival Documentation: Matthews and Whitaker owned site 3MS21 prior to the 20th century (see Archival Documentation of 3MS199 for these details). Site 3MS21 went to the Buckeye Lumber Company in about 1905 (Mississippi County Real Estate Tax Records, Osceola 1905). By 1913 it had been sold to J.E. Miller; then shortly thereafter to L.C. Henley. G.W. Bowman acquired the property in 1920, and retained it until at least 1940

(Mississippi County Real Estate Tax Records, Blytheville, 1908-1940).

Proposed Site Function and Cultural Affiliations

This site has intact features and deeply stratified deposits which are isolable components from the Woodland and possibly Mississippi periods. This site had a reported mound on it, which was bulldozed in the 1950s. It is possible that this was an important ceremonial site as well as occupation site. It is likely that the base of the mound is still present on the site as has been the case of other bulldozed mounds (cf. Jenkins 1978). Good examples of daub were recovered, indicating the presence of possible structures from the Woodland period. The mixed tempers in some sherds may be important data on the transition from the Woodland to Mississippian.

Management Department

NRHP Significance: The fact that two features were identified in two test units is enough to make this site significant. The association of daub in large pieces, with large (2cm) diameter cane impressions associated with Woodland pottery is also quite rare. This site also contains carbon and had a mound. It is clearly a significant site and may contain unique qualities.

Data Limitations: The surface limits of the site have not been fully defined by controlled surface collection. We have even less knowledge of the subsurface extent of the site and what variation is present in site depth.

Proposed Impacts: This site is currently cut by Ditch 10 and will have a much larger area excavated on the east side where the levee is located.

CRM Recommendations: (1) More extensive testing to define site limits and to document artifact variation and surface limit, (2) route project around the site, or, (3) cancel this section of the project.

SITE 3MS477 (29A10)

Description

Period/Time: Barnes

Site Area: ~0.12ha

CSC (Square meters): 17 artifacts point plotted.

Maximum known depth: ?

Nature: There was a light scatter of Barnes sherds and some lithics between Ditch 10 and levee. It is situated on a slight rise which is the remnant of the small spoil pile from Ditch 10 excavations. The soils are mapped as Routon-Dundee-Crevasee Complex (Ferguson and Gray 1971:Sheet 2). No material was collected on the west side of the ditch. The site area was walked at a meter interval by a crew of five people. All artifacts were flagged and then mapped. Artifacts recovered consisted of very small Barnes sherds and one core (Crowley's Ridge gravel) chopper tool. No material was recovered in the test unit. The documented presence of the spoil pile on the east side of the ditch, and the geomorphic location of the ditch strongly suggests that there may be deeply buried deposits in this part of the project area.

Methods of Testing and Results

Controlled Surface Collection: Because of the low surface density of artifacts they were point plotted and collected by FSN. A total of 28 artifacts were collected (Table C-9). These consisted of Barnes Plain and Cordmarked sherds and one biface flakes on Crowley's Ridge gravel. These were apparently randomly distributed over the surface of the site and were probably dredged up by the original ditch excavation.

Test Units No test unit was excavated at this site because the landowner objected to any excavations on his land.

Proposed Site Function and Cultural Affiliations

This appears to be a small Late Woodland homestead.

Management Department

NRHP Significance: Unknown

Data Limitations: No intact deposits have been found in the limited investigations.

Proposed Impacts: Unknown

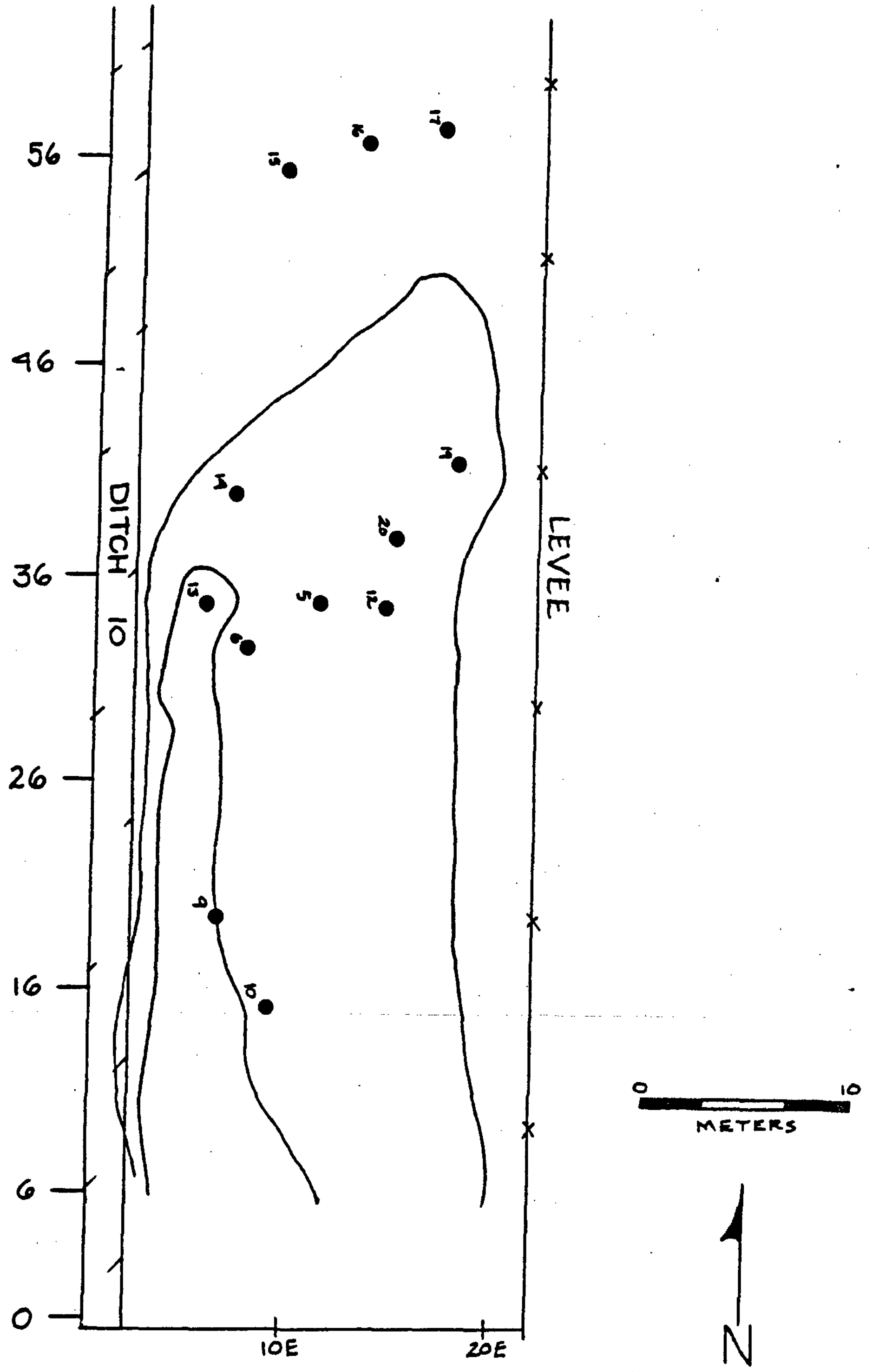

Figure B-31. 3MS477, Site Map of Point Plotted Artifacts.

CRM Recommendations: (1) More extensive testing. (2) Route project around the site, or, (3) cancel project this section of the project.

The above five sites are in an area which has demonstrated stratified deposits which could very well span the archeological record. I believe that these deposits are significant in terms of the NRHP criteria and that it is quite possible that in places there will be buried deposits as deep as 3 or 4 meters. These five locations need more extensive investigations that will define the nature of the deposits and will date them.

INSIGNIFICANT SITES

SITE 3MS474 (29A6)

Description

Period/Time: Historic, middle 20th century

Site Area: .36 ha

CSC (Square meters): 1425

Maximum known depth: 30cm BS (Plowzone)

Nature: Artifact scatter in corner of field adjacent to road. The site is situated on Dundee-Dubbs-Crevass (Ferguson and Gray 1971:Sheet 2) soils associated with the Relict Braided Channel to the north of the site and Buffalo Creek to the west.

Methods of Testing and Results

General Surface Collection: The general collection was made when the site was first discovered and consisted of a chert road gravel, a threaded bottle neck with the seam through the lip and a blue earthenware cup handle (Table C-10). These indicated occupation after 1902.

Controlled Surface Collection: The controlled surface collection was made in a cruciform with the center impressionistically defined at the center of the flagged artifacts. A wide range of artifacts were recovered in the controlled surface collection. Glass was the most frequent artifact type of the 1090 artifacts recovered. This was followed by metal, earthenware and unmodified chert gravels (Table C-10). The earthenware was largely whiteware, with virtually no stoneware. Most of the storage technology appeared to center on canning jars with glass

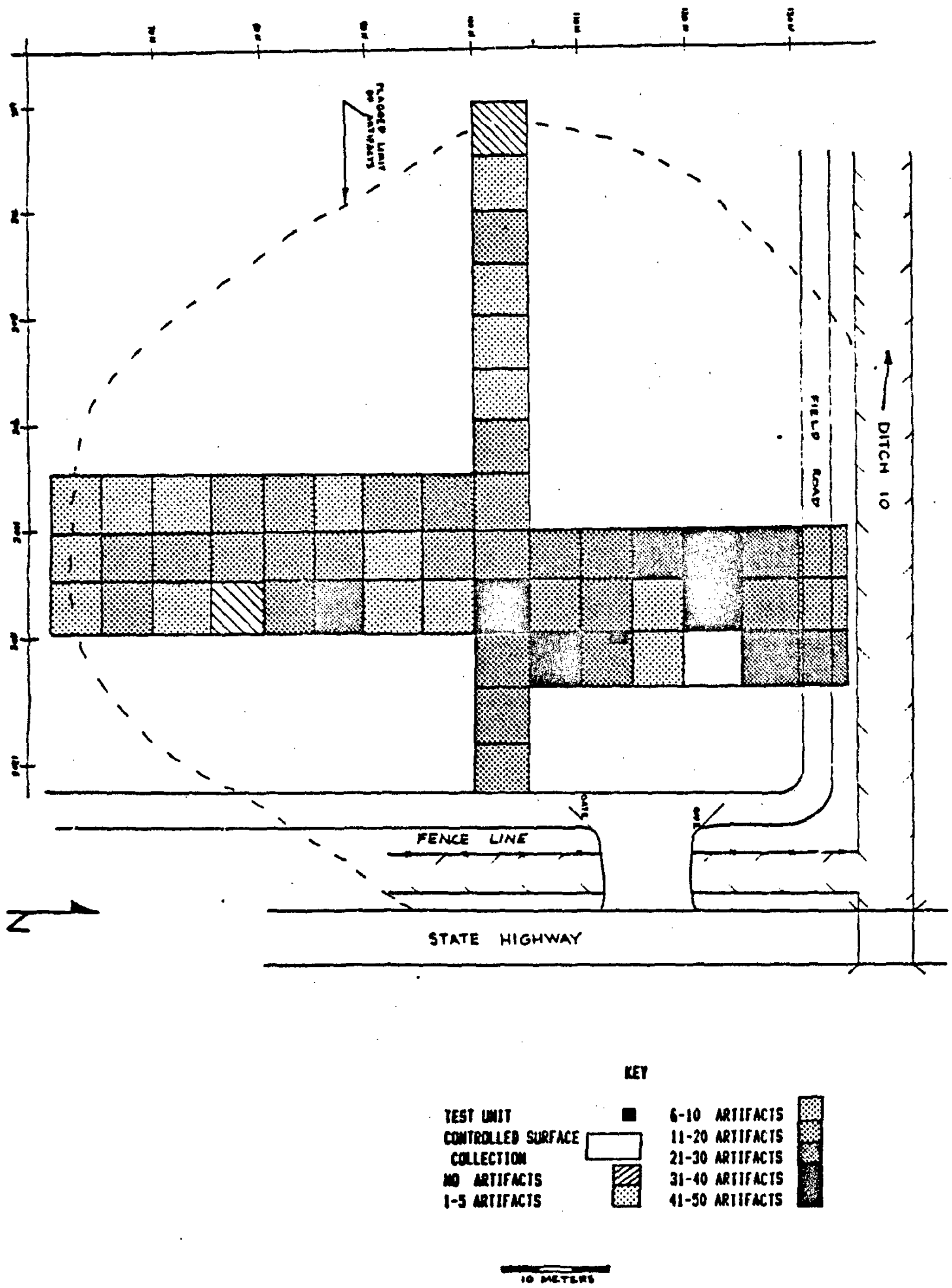

Figure B-32. 3MS474, CSC, Historic Sherds.

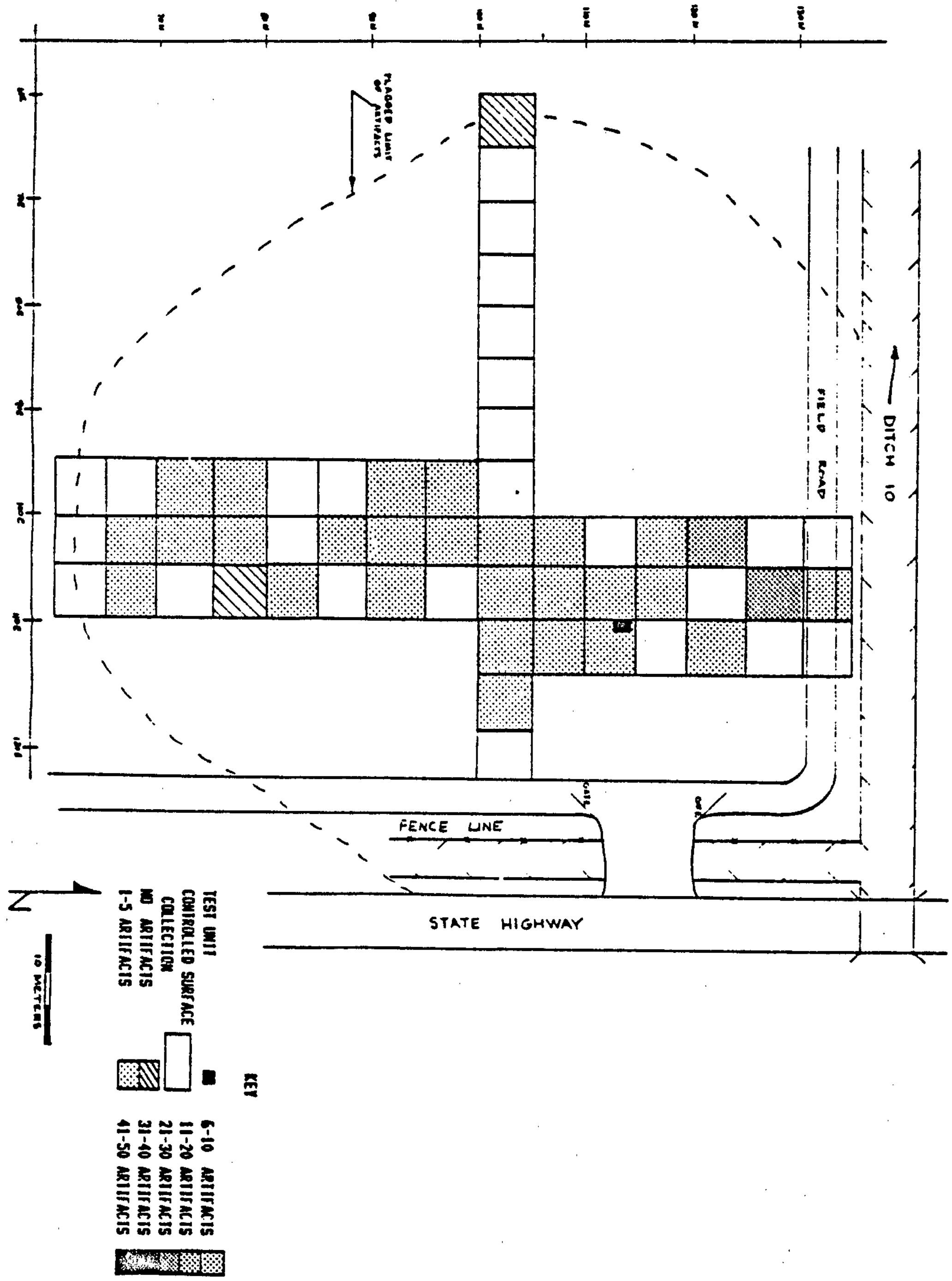

Figure B-33. 3MS474, CSC, Historic Construction Materials.

lids, indicating occupation after ca. 1920. A fairly large amount of plastic and other synthetics were recovered indicating occupation into the 1950s. The assemblage is typical of the usual debris associated with 20th century house sites.

The presence of a structure is strongly indicated by a variety of building materials (brick, flat glass, wire nails, and bolts) which suggest the structures were located at 70N100E and 110N100E. Interestingly there is a low density of sherds at these two locations with higher densities around them.

Test Unit 1 was excavated at 113N110E (Figure B-32) in the densest part of the surface scatter. The unit was excavated to 50cm below the surface in 10cm levels (Table C-11). Artifacts were recovered in the upper 30cm of the excavation, which was the dark yellowish brown silty plowzone. No artifacts were recovered in the mottled yellow brown and grayish brown sand (Figure B-34).

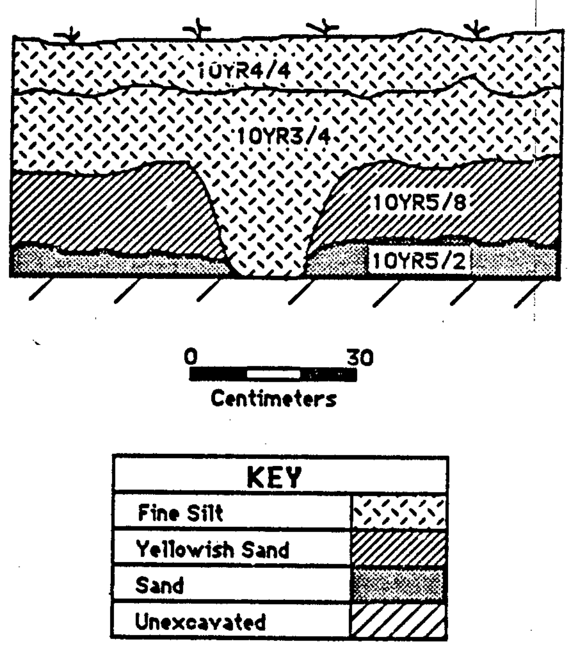

Figure B-34. 3MS474, Test Unit 1, East Profile.

Historic Documentation

Historic Maps: The 1945 Manila USGS quadrangle shows two structures at this location. Nothing is shown at this location on the 1830 GLO maps.

Archival Documentation: Site 3MS474 is on such undesirable land that it was never claimed from the state. By 1935 it had come under the control of Drainage District #12, but has since been transferred to the Arkansas Game and Fish Commission as part of a wildlife refuge (Mississippi County Real Estate Tax Records, Osceola 1879-1905; Mississippi County Real Estate Tax Record, Blytheville 1908-1940).

Proposed Site Function and Cultural Affiliations

This site is a mid-20th century domestic house site.

Management Department

NRHP Significance: Archeologically this site is not significant because it is largely disturbed by plowing (and there are still some of these sites which have not been plowed), is mostly from the plastic period, and is therefore too recent to be significant. The owners are not of historic importance.

Data Limitations: There could be undisturbed sub-plowzone features.

Proposed Impacts: Equipment tracking over in association with excavation and tree clearing.

CRM Recommendations: No further archeological work.

SITE 3MS473 (29A3 & 29A5)

Description:

Period/Time: Barnes, Mississippian, Historic

Site Area: >0.25 ha

CSC (Square meters): 1200

Maximum known depth: 33cm

Nature: Light scatter of prehistoric material on both sides of Ditch 10 on edge of sandy soils of the Dundee-Dubbs-Crevass Complex (Ferguson and Gray 1971:Sheet 9) which were at one time the levee of Buffalo Creek. This was in very low density with a high proportion of lithics. Historic component appears to be

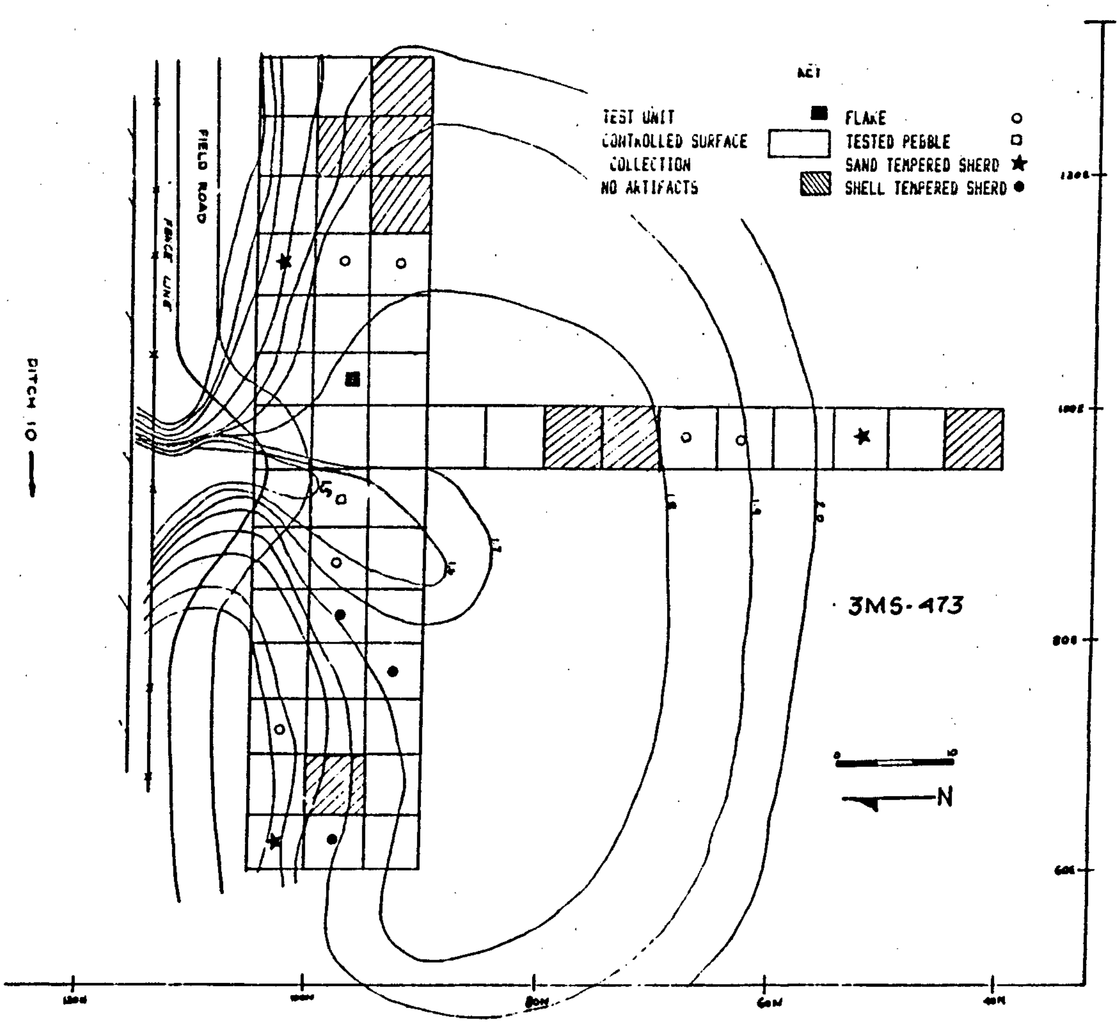

Figure B-35. 3MS473, CSC, Prehistoric Artifacts.

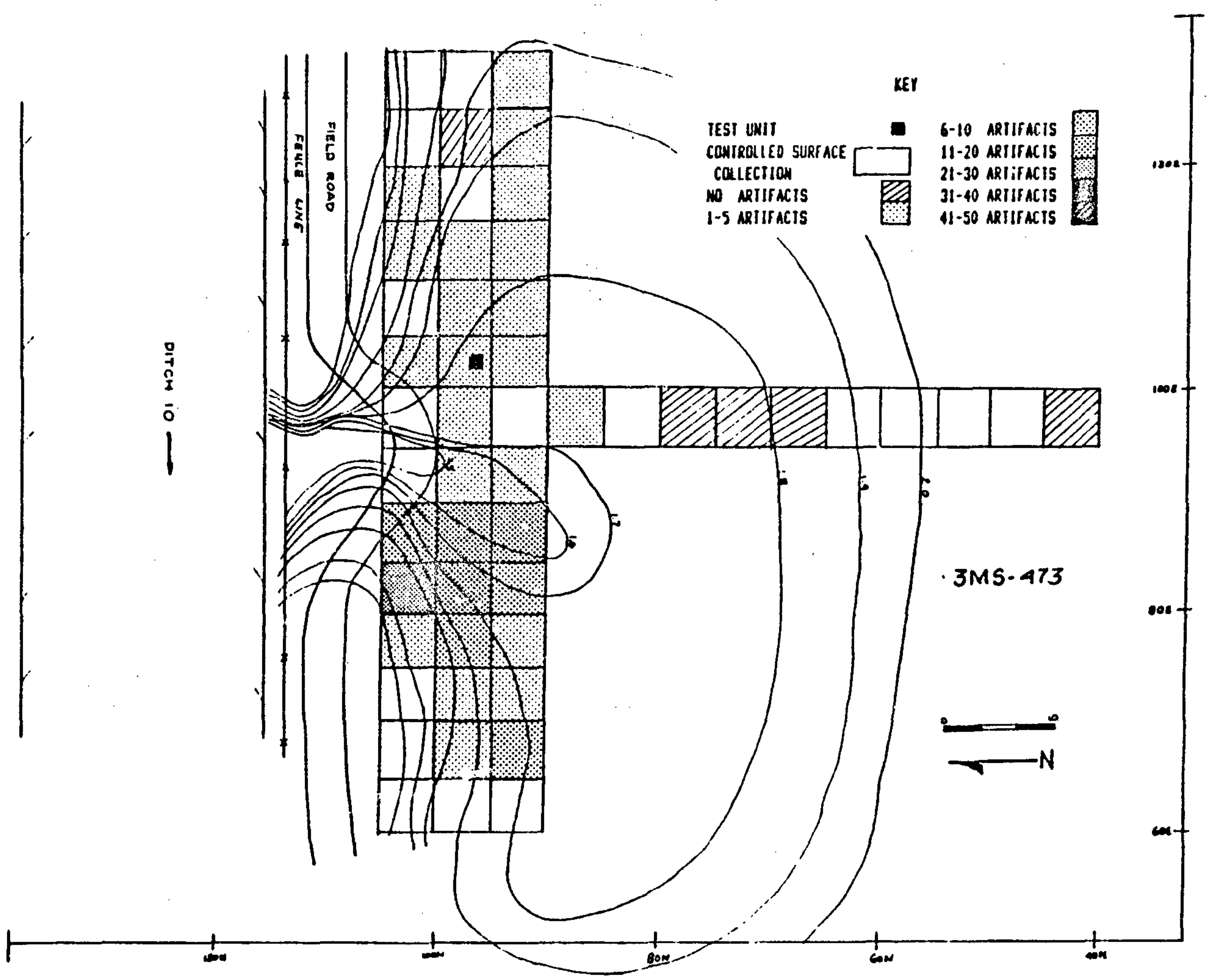

Figure B-36. 3MS473, CSC, Historic Sherds.

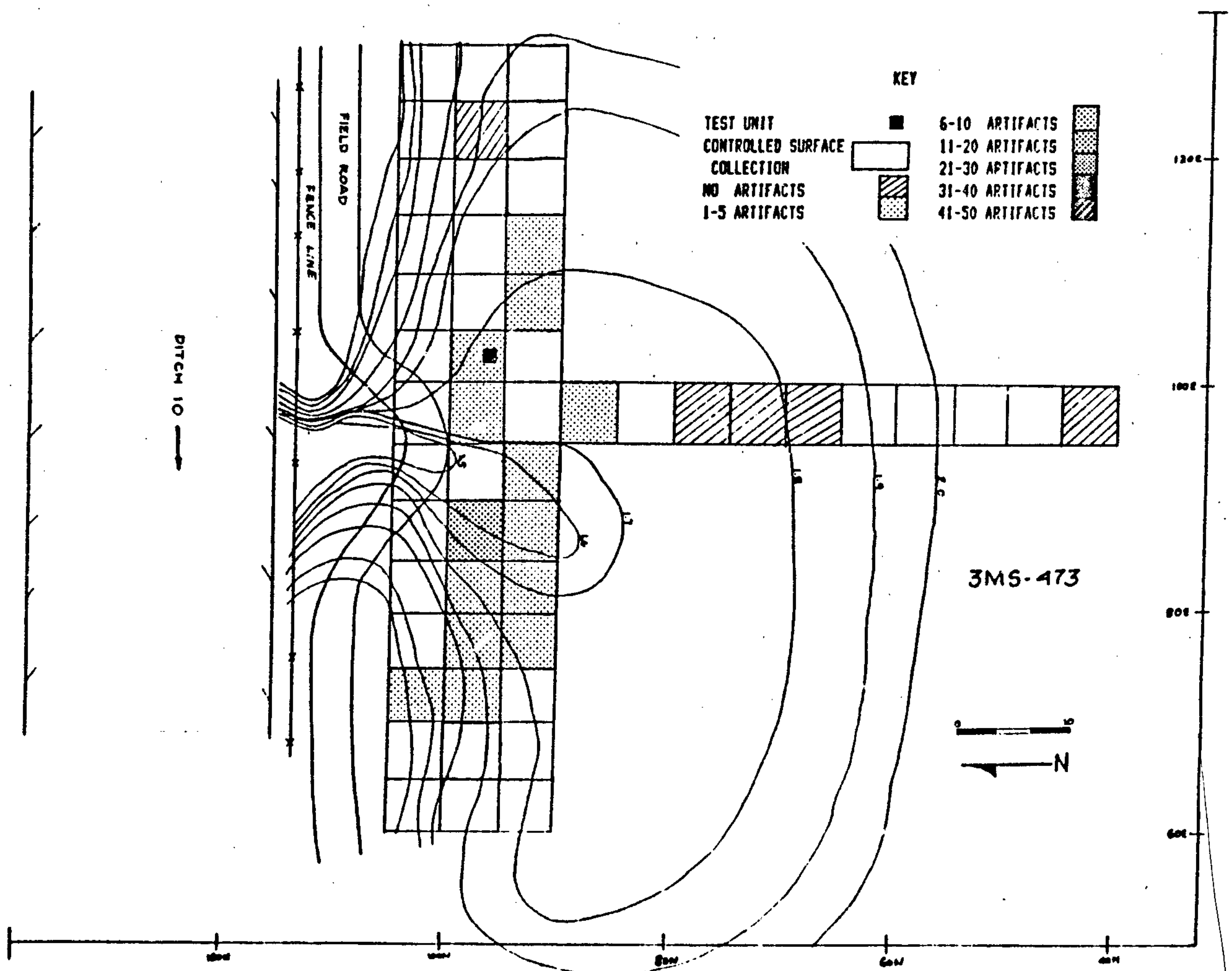

Figure B-37. 3MS473, CSC, Historic Construction Materials.

an older dump site, though some bricks are in evidence. The historic component is on only the south bank concentrated around the ditch, which is a common location for dumps. The artifacts on the north side of the ditch were point plotted and all were on the spoil pile. The test unit was excavated off the spoil pile on the south side of the ditch. Historic material was found in the 20cm-thick plowzone and two flakes were found in the succeeding two levels (20-40cm BS). Excavations were terminated at 60cm without encountering any additional material.

Methods of Testing and Results

General Surface Collection: A general grab collection was made upon discovery of the site. This was all recent historic material (Table C-12).

Controlled Surface Collection was made in the cruciform pattern and extended to areas of very low artifact density. The highest historic artifact density centered in the draw near the center of the site (Figure B-36). Most of this was very recent kitchen debris. The lack of building material and its position in the draw strongly support the proposition that this is a historic dump site (Figure B-37).

The prehistoric components were quite hard to find. The sherds and flakes are not in continuous distribution and are on the higher points of the site, especially on the spoil piles (Figure B-35). Over half of the prehistoric artifacts were found on the spoil pile north of Ditch 10. Both Mississippi Plain and Barnes Plain sherds were found.

Test Unit 1 was excavated in a higher artifact density near the center of the artifact scatter (Figure B-36). It was excavated to 60cm below surface (Figure B-38) in 10cm levels (Table C-13). Four distinct fine brown silt plowzones were observed in the upper 20cm of the profile. Level 0-10cm was dark brown. Level 10-13cm was a yellowish brown. Level 13-18cm was a very dark grayish brown and Level 18-20cm was a dark brown. All of the above were fine silt. This was underlain by a 20cm (20-40 cm BS) thick heavily mottled grayish brown silt. One flake was recovered from the upper 5cm (i.e., 25cm BS) of this zone. The lowest 20cm of the unit (i.e., 40-60cm BS) was light yellowish brown fine silt. No artifacts were recovered in this unit.

Historic Documentation

Historic Maps: The 1945 USGS Manila quadrangle map and the 1830 GLO maps show no structure or other cultural feature at this location. There is a house shown approximately 200m due south of this site on the 1945 map and it is probable that this is a dump associated with that structure.

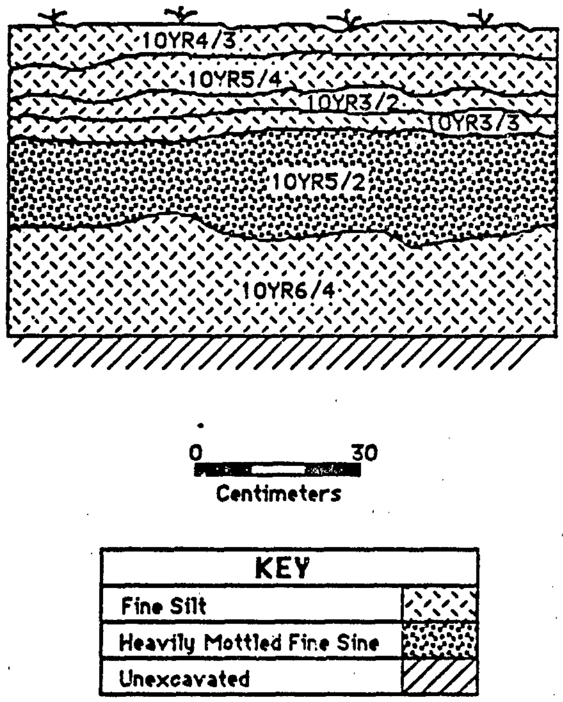

Figure B-38. 3MS473, Test Unit 1, East Profile.

Archival Documentation: Site 3MS473 is on such undesirable land that it was never claimed from the state. By 1935 it had come under the control of Drainage District #12, but has since been transferred to the Arkansas Game and Fish Commission as part of a wildlife refuge (Mississippi County Real Estate Tax Records, Osceola 1879-1905; Mississippi County Real Estate Tax Record, Blytheville 1908-1940).

Proposed Site Function and Cultural Affiliations

The historic component is a mid-20th-century dump site. There are two prehistoric components present on this site: a Barnes and Mississippian component. The most continuous distribution of pottery appears to be east of south of the main historic site on a low sandy rise. The artifact densities in this area are less than 1 artifact/25 square meters. Thirty meters to the west the soils become gray clays associatted with the fill of the Buffalo Creek Channel.

Management Department

NRHP Significance: The historic component is too recent to be significant in terms of the NRHP criteria. The prehistoric components do not have the demonstrated characteristics of a significant site. The artifacts are in very low density (10 flakes per cubic meter, and three prehistoric artifacts in the controlled surface collection). The soils are not anthropocized. This site is in a high probability area for buried deposits, and there are other known productive sites located along this same levee.

Data Limitations: The distribution of artifacts suggests that the main part of the site is buried under the spoil pile on the south side.

Proposed Impacts: Brush clearing

CRM Recommendations: Have archeologist monitor and record profile during brush clearing.

SITE 3MS472 (4B)

Description

Period/Time: Historic

Site Area: 0.25 ha

CSC (Square meters): 1400

Maximum known depth: 40cm BS

Nature: Scatter of artifacts in corner of field adjacent to road includes building materials and domestic artifacts. It is positioned on the Relict Braided surface on Routon-Dundee Crevasse soils Complex (Ferguson and Gray 1971:Sheet 9). This is adjacent to the the Osceola to Grand Prairie Mo., road shown on the GLO Maps and still partially used in 1903. The road followed the higher levee on the west side of Big Lake. The artifacts recovered in the CSC were from a wide range of times, but tended toward the Early 20th century.

Methods of Testing and Results

General Surface Collection: A grab collection was made on the initial discovery of this site. This collection included molded whiteware, stoneware, and milk glass suggesting occupation some time in the early to mid-20th century.

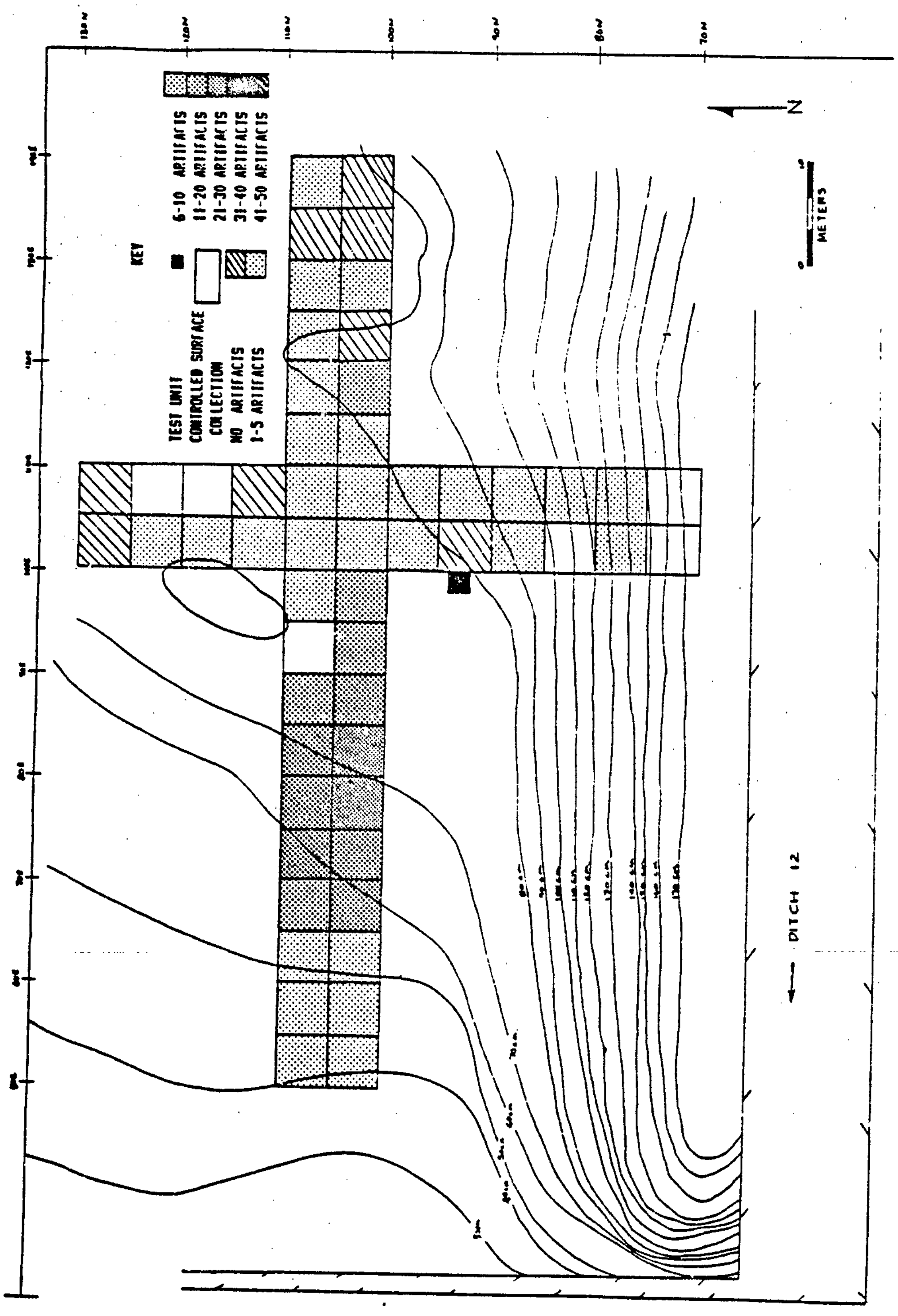

Figure B-39. 3MS472, CSC, Historic Sherds.

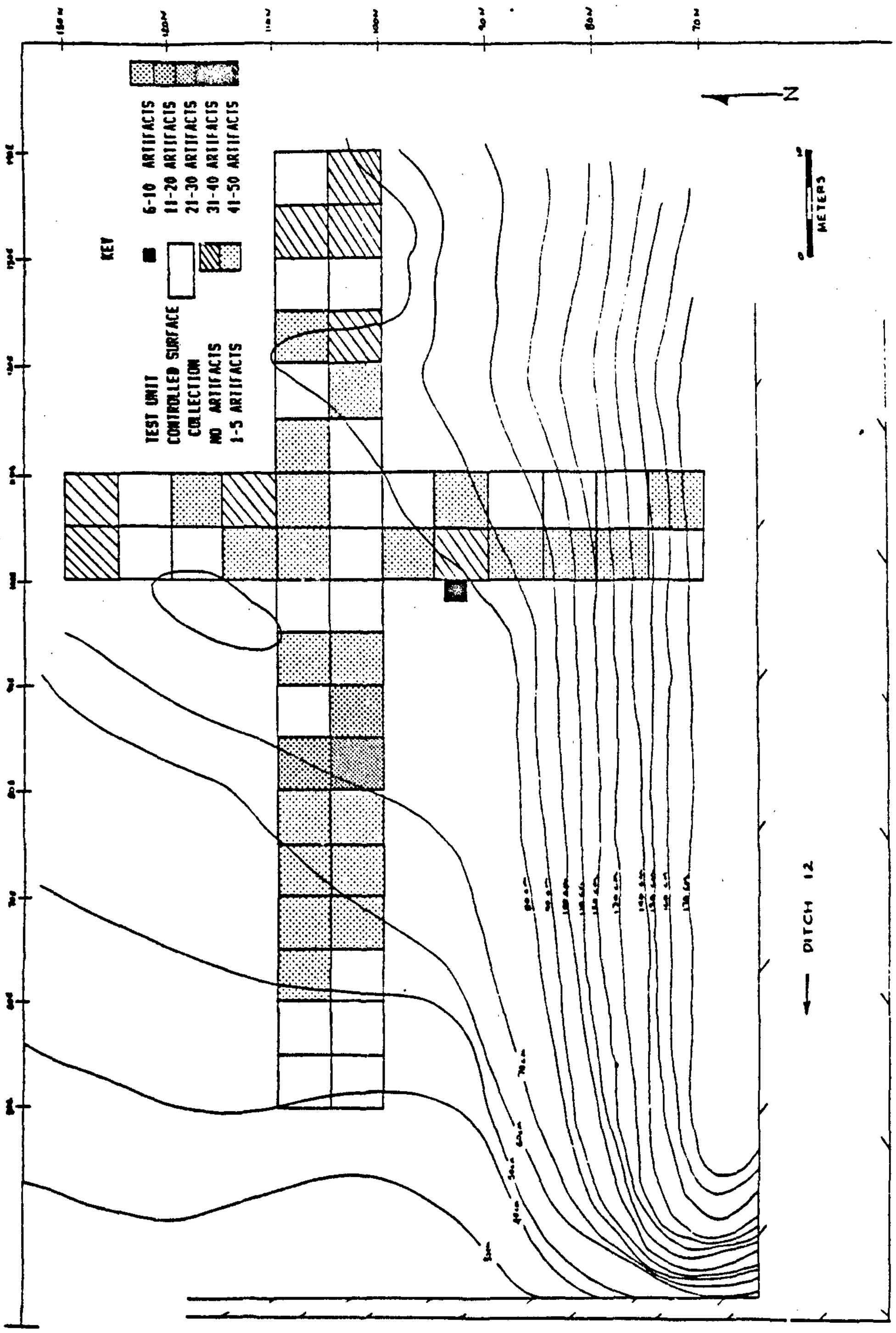

Figure B-40. 3MS472, CSC, Historic Construction Material.

Controlled Surface Collection: The controlled surface collection was in the usual cruciform pattern and ran from the spoil pile north to where the artifacts stopped. This collection indicates that the site limits were approximately 60m north of the ditch and almost 100m long. There is a very high density of sherds concentrated at 100N80E (Figure B-39). The assemblage consisted of the usual mid-20th century Eurojunk commonly found on these historic sites (Table C-14). There was very little plastic, suggesting that the preponderance of the occupation was prior to 1951. Brick, wire nails, cast iron stove parts, flat glass and water pipe all support the proposition that there was a structure on this site located at ca. 80E100N (Figure B-40).

Test Unit 1 was excavated just north of the levee at grid coordinates 91N99E (Figure B-39). This was on the edge of the spoil pile slope where it leveled off to the flat area. The test unit was inadvertently placed in a low density area on the site but within the impact zone. The test unit was excavated in 10 cm levels to a depth of 60cm. Two plowzones were evident to a depth of 40cm BS (Figure B-41). The upper 20cm was a homogeneous dark brown silty loam. This was underlain by a homogeneous dark grayish brown silty loam to a depth of 40cm. At the base of this level there were 40cm thick siltation bands covering the mottled yellowish brown silty intact Relict Braided Surface B Horizon soil, which was devoid of cultural material and artifacts.

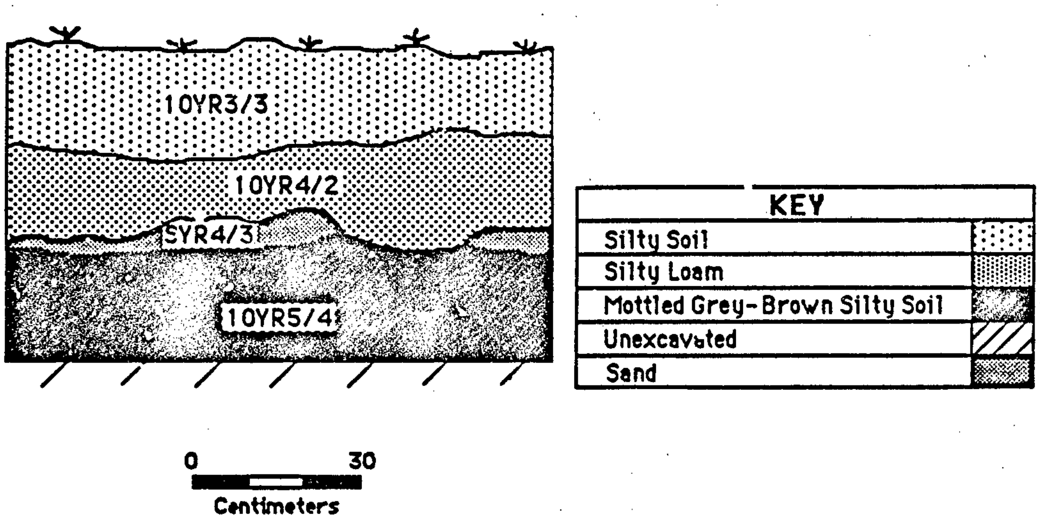

Figure B-41. 3MS472, Test Unit 1, East Profile.

Historic Documentation

Historic Maps: This area is shown as the course of the Grand Prairie to Osceola road on the 1830 General Land Office map. The 1945 USGS Manila Quadrangle shows a structure at this location. This is also located in the "Arm of Big Lake" (Harris 1980). The 1945 map shows that most of the four surrounding sections were still in forest. All of this indicates poorly drained soil conditions not conducive to agriculture.

Archival Documentation: Site 3MS472 was held in common with sites 3MS199, 3MS471, 3MS119 and 3MS21 by Matthews and Whitaker during the last part of the 19th century (see "Archival Documentation 3MS199 for this history). Like the others it also went to Buckeye Lumber in about 1905 (Mississippi County Real Estate Tax Records, Osceola 1905). By 1913 it had been transferred to the Barron & Fisher Land Company. W.I. Hayes bought the land in about 1920, but by 1930 it was owned by the Monarch Investment Company. By 1940 this property was owned by J.C. Steele (Mississippi County Real Estate Tax Records, Blytheville 1908-1940).

Proposed Site Function and Cultural Affiliations

This is a recent historic farmstead.

Management Department

NRHP Significance: This site is not significant. It is too recent to be considered old enough for historical archeological significance, is not associated with a historic personage and appears to be largely restricted to the plowzone.

Data Limitations: It is possible that there are intact subplowzone features, but determining this would require stripping off the whole plowzone.

Proposed Impacts: Equipment tracking during construction, brush clearing.

CRM Recommendations: No further archeological work.

SITE 3MS478 (A16)

Description

Period/Time: Historic

Site Area: 0.64 ha

CSC (Square meters): 1,800

Maximum known depth: 24cm BS (Plowzone)

Nature: Scatter of artifacts in corner of field adjacent to road includes building materials and domestic artifacts. It is positioned on the Relict Braided surface on Routon-Dundee Crevasse soils Complex (Ferguson and Gray 1971:Sheet 9). This is adjacent to the the Osceola to Grand Prairie, Mo. road shown on the GLO Maps. This site appears to be different from 3MS472 on the north of the ditch, with most of the concentration located outside the impact zone. The deposits are restricted to the plowzone.

Methods of Testing and Results

Controlled Surface Collection: 515 artifacts weighing 4.016 kg were recovered in the controlled surface collection. Most of this was the usual kitchen debris associated with mid-20th century homesites. These were concentrated in the low area near 110N90E (Figure B-42). There was a very low density of construction material, which included flat glass, nails, bolts, electric insulators and brick. These were also concentrated in the same low area as the sherds.

Test Unit 1 was positioned at 121N100E in a low spot off the spoil pile in a unit which produced no artifacts in the CSC (Figures B-42 and B-43). The unit was excavated to 45cm BS. The upper 34cm was plowzone as evidenced by the homogeneous dark brown silt from 0 to 22cm followed by a dark grayish brown silt from 22 to 35cm BS. This had a very low artifact density with the last artifact found at 32cm BS just above a stratum mottled yellowish brown sand. The water table was encountered at 45cm which halted the excavation of this interesting culturally deprived unit on an improbable site.

Historic Documentation

Historic Maps: This area is shown as the course of the Grand Prairie to Osceola road on the 1830 General Land Office map. The 1945 USGS Manila quadrangle shows a structure at this location. This is also located in the "Arm of Big Lake" (Harris 1980). The 1945 map shows that most of the four surrounding sections were still in forest. This all indicates poorly drained soil conditions not conducive to agriculture.

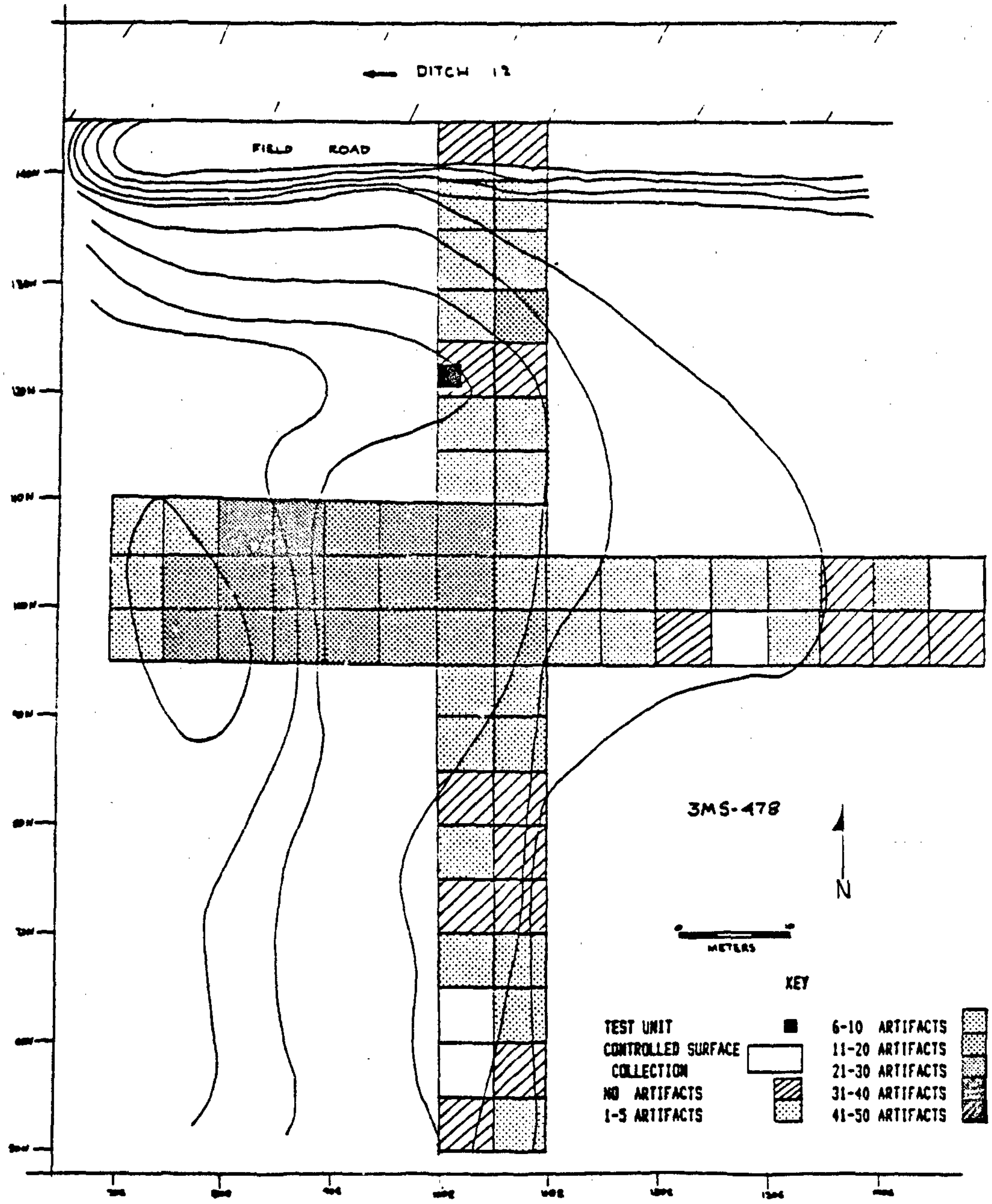

Figure B-42. 3MS478, CSC, Historic Sherds.

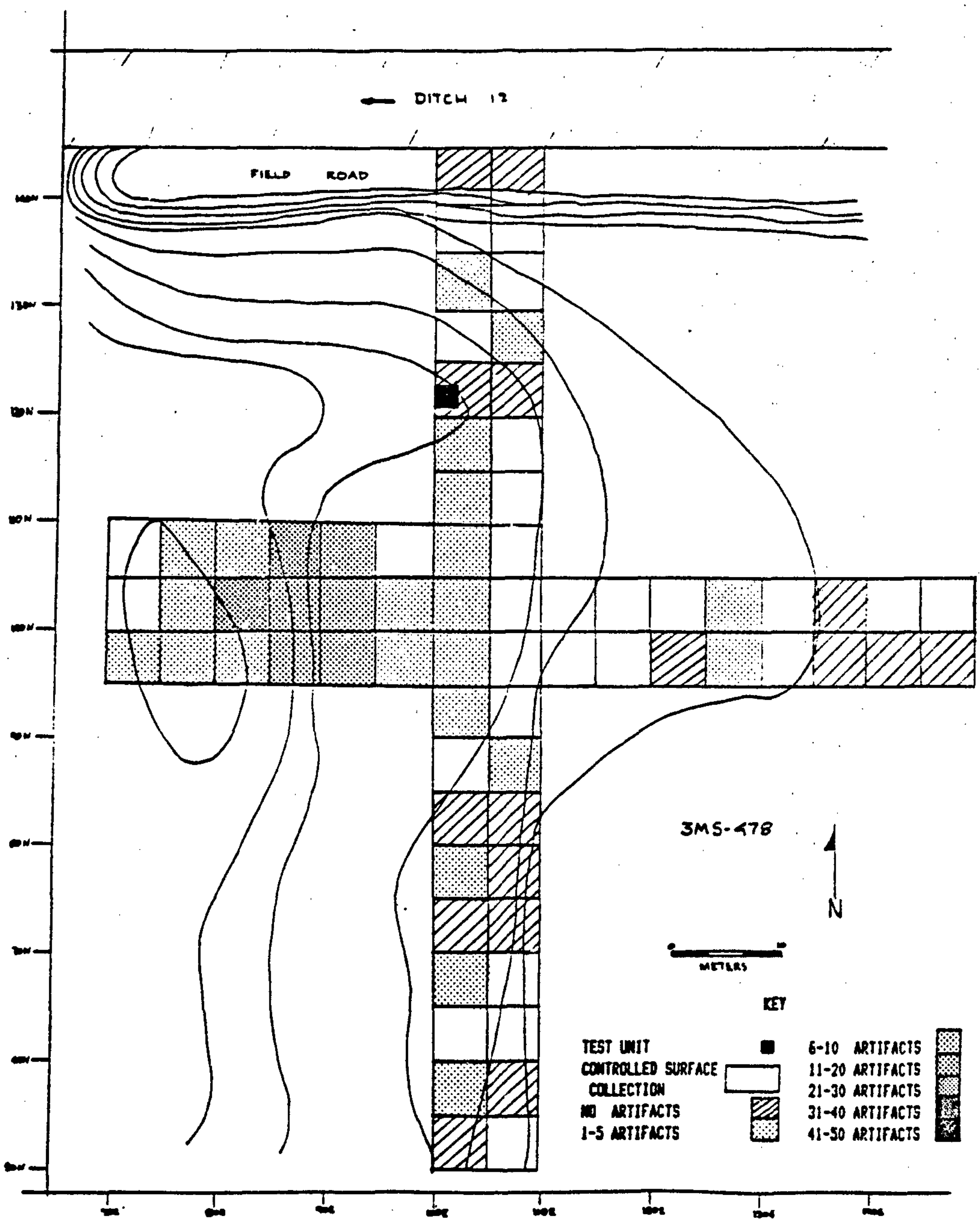

Figure B-43. 3MS478, CSC, Historic Construction Materials.

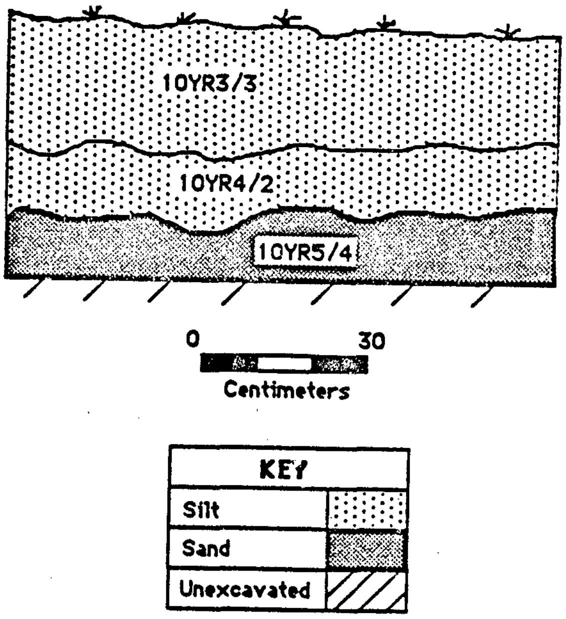

Figure B-44. 3MS478, Test Unit 1, East Profile.

Archival Documentation: Site 3MS478 has a different history than the others, and so is in a category by itself. Under the Swamp Land Act of 1850, persons who built levees or drains to reclaim swamp lands could be rewarded by the State of Arkansas with scrip which could be used to purchase other land. George W. Underhill was a contractor who built a line of levees along the Mississippi River in the early 1850s, and so accumulated a large amount of swamp land scrip. In 1852 Underhill sold $30,000 worth of that scrip to Jeptha Fowlkes. The agreement was that Underhill was to use the scrip to purchase certain lands, including 3MS478, and then to deed those lands to Fowlkes. An agent, Jo Williams, was chosen to select the lands, and Fowlkes paid for the scrip. Unfortunately, Underhill died in 1854 before he could execute a deed for the lands to Fowlkes. The administrators of Underhill's estate issued a certificate of purchase to Fowlkes on 24 April 1855, and directed Jessie Jackson, the U.S. land agent at Helena, to take care of the problem and to issue the proper titles to Fowlkes. For some

The Civil War intervened, and Fowlkes died in 1863. In 1867 David C. Cross, presented himself to the Auditor of State in Little Rock as the assignee of the title to the same lands, and, although he was unable to produce affidavits or other evidence of his right to title of these lands, deeds were issued in his name. Cross owed money to the Citizens Bank of New Orleans, and under a judgement from a federal court Cross' title passed to the bank to satisfy his debt.

Meanwhile, Fowlkes' heirs sued the bank to regain title to the lands. In May 1880 the Mississippi County Circuit Court ruled that the Fowlkes heirs were the rightful owners of the property and ordered the state to cancel the deeds issued to Cross (Mississippi County Deed Record, Osceola 13:211-217).

On 11 August 1882 the Fowlkes heirs, widow Sarah W., sons Jeptha M., and David, daughters Maggie C., Edna A. Hatcher, and Annie L. Hayden, and Daniel H. Hayden, Annie's husband, all of Shelby County, Tennessee, sold large amounts of land in Greene, Craighead, and Mississippi Counties to Horace Allen of Indianapolis for $1. Four months later they sold another large parcel of land to Allen through his agent J.J. Mitchell (Mississippi County Deed Records, Osceola 11:501-512). On 17 June 1884 Mitchell, acting for Allen, sold both parcels of land to Andrew Whitten of Couston Newtyle, County of Forfor, Scotland. The money, $1 per acre, was paid by Dundee Investments Limited, represented by John M. Judah, its attorney (Mississippi County Deed Records, Osceola 13:156-162, 180-184).

Whitten amassed large holdings in Craighead, Crittenden, Greene, White, Woodruff, and Mississippi Counties. He sold them all on 24 October 1890 to John M. Judah and Albert S. Caldwell of Memphis, doing business as Caldwell & Judah, for $1 (Mississippi County Deed Record, Osceola 15:587-591). Caldwell & Judah in turn sold the property to James Haggert of Jackson County, Missouri, and William McMaster of Multnemah County, Oregon, on 11 February 1896, also for $1 (Mississippi County Deed Record, Osceola 18:533-535).

Haggert and McMaster soon sold 15,172 acres, including 3MS478, to Herman Paepcke of Chicago on 22 July 1899. Paepcke paid $15,091 in cash and issued $45,600 in notes payable in gold coin at the German National Bank in Little Rock (Mississippi County Deed Record, Osceola 23:540-544). Paepcke was just a middle man, however, for less than two weeks later he sold the property to the Chicago Mill and Lumber Company for $1 with the company to take over the promissory note (Mississippi County Deed Record, Osceola 25:77-81).

Chicago Mill and Lumber kept the land until about 1913 when it was owned by Boyenton Land and Lumber. By 1920 it was owned by J.M. Hutton; by 1925 the owner was J.K. Rhodes; and by 1930 E.C. Stuck was the owner (Mississippi Real Estate Tax Records, Blytheville 1913-1940).

Proposed Site Function and Cultural Affiliations

This is another example of a mid 20th century historic site of the small yeoman farmers who at one time inhabited the Buffalo Island.

Management Department

NRHP Significance: This site is too recent and does not have the intact deposits to have the integrity for significance.

Data Limitations: It is possible that there are subplowzone pits on this site. Stripping of the whole plowzone would be required to prove or disprove their presence. This needs to be done on a sample of these sites at some time in the future.

Proposed Impacts: Equipment tracking during construction, brush clearing.

CRM Recommendations: No further archeological work.

SITE 3MS475 (29A8)

Description

Period/Time: Barnes

Site Area: >0.14 ha

Nature: Small restricted and nucleated scatter of sherds 40m west of Ditch 10. It is on a slight rise positioned on the Relict Braided surface on Routon-Dundee Crevasse soils Complex (Ferguson and Gray 1971:Sheet 2). It is probably an isolated farmstead, but could be part of a larger buried site.

Methods of Testing and Results

This small site was discovered during the initial survey. A collection was made at this time because the limited site size and low artifact density would have made the relocation of this site difficult, if not impossible, during the testing phase. Unfortunately, when we asked permission to test the site it was refused.

General Surface Collection contained one small fragment of glass, 1 Barnes sherd and daub with reed impressions.

Proposed Site Function and Cultural Affiliations

This site is probably a small Barnes homestead used to exploit the backwater areas.

Management Department

NRHP Significance: Undetermined

Proposed Impacts: None anticipated, this site is at the extreme western edge of the impact zone and will not be affected by the proposed excavation of the ditch.

CRM Recommendations: No further archeological work.

SITE No. 3MS476 (29A9)

Period/Time: Barnes

Site Area: >0.16 ha

Nature: Small highly restricted scatter of Barnes pottery. It is on a slight rise positioned on the Relict Braided surface on Routon-Dundee Crevasse soils complex (Ferguson and Gray 1971:Sheet 2). May be related to 3MS475 and 3MS477 in that all are highly restricted scatters of Barnes sherds.

Methods of Testing and Results

General Surface Collection was made by flagging all artifacts to map their dispersion. All observed artifacts were collected after intensive row by row scrutiny by a crew of three. Every artifact was collected (Table C-17) and these indicate a Barnes occupation.

Proposed Site Function and Cultural Affiliations

This site is probably a Barnes homestead. It is possible that there is a house, and it is also possible that there are deeper stratified deposits.

Management Department

NRHP Significance: Undetermined

Proposed Impacts: None on edge of west impact zone.

CRM Recommendations: No further archeological work.

29A1

Period/Time: Mid-20th century

Site Area: >0.16 ha

Nature: Small highly restricted scatter of historic pottery, glass, metal and plastic. It is on a slight rise positioned on the edge of the modern meander belt on Sharkey-Steele soils complex (Ferguson and Gray 1971:Sheet 2).

Methods of Testing and Results

General Surface Collection was made by flagging all artifacts to map their dispersion. All observed artifacts were collected after intensive row by row scrutiny by a crew of three.

Test Unit 1 was located at 37N108E at roughly the center of the site. This unit was excavated down to 60cm BS. Three different strata were present. From 0 to 12cm the plowzone consisted of a very dark grayish brown silty loam. The historic material consisted of glass and whiteware fragments, charcoal and metal bits as well as one button. The second stratum, from 12 to about 40cm BS was a very dark gray silty clay loam. The material from the 12 to 20cm level was similar to that in the plowzone but sparser. Between 20-30cm there is an increase in the quantity and diversity of material. Metal fragments, a red rubber ball, glass and plastic fragments were found at this level. From 30-40cm the findings diminished drastically to give way to a sterile grayish brown mottled with orange silty clay.

Historic Documentation

Historic Maps: The 1955 USGS Blytheville quadrangle shows a structure at this location. The 1939 and 1976 editions of this quadrangle show no structures at this location.

Proposed Site Function and Cultural Affiliations

This is a mid-20th century house site.

Management Department

NRHP Significance: This site is too recent to be considered significant.

Proposed Impacts: None on edge of west impact zone.

CRM Recommendations: No further archeological work. The status of this potential site should be reassessed in 35 years.

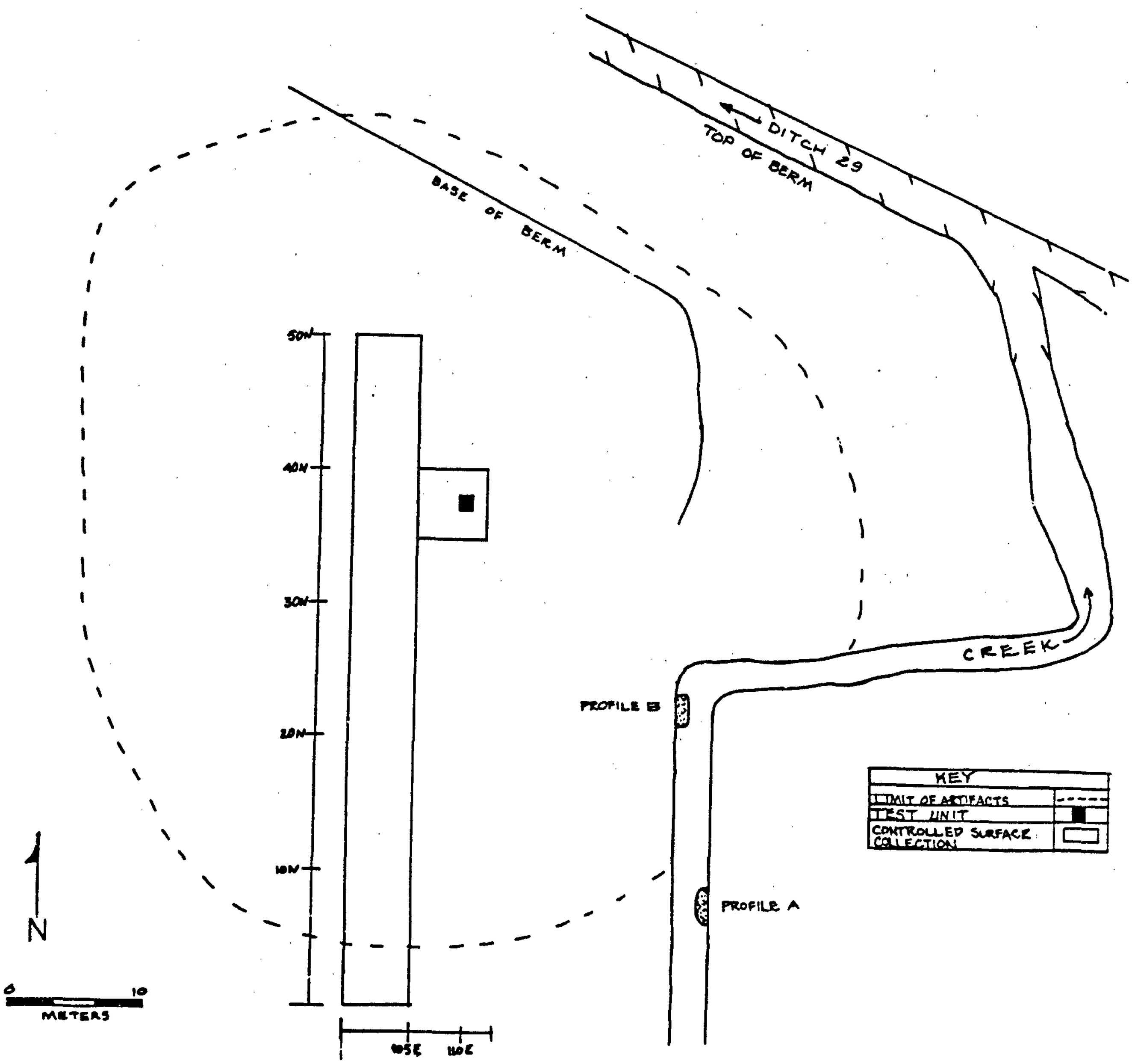

Figure B-45. Site 29A1, Site map.

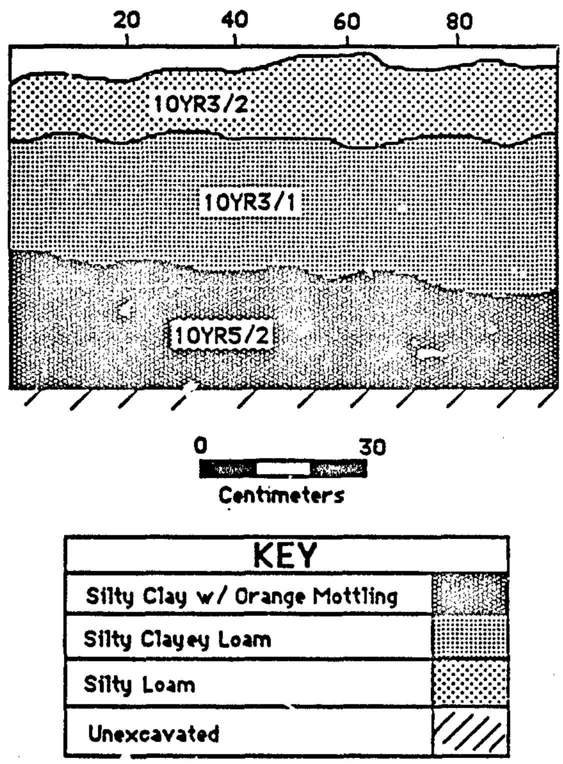

Figure B-46. Site 29A1, Test Unit 1, profile.

REFERENCES CITED

Mississippi County
Deed Records, Osceola. Available at the Mississippi County Courthouse, Osceola, Arkansas.

Real Estate Tax Records, Blytheville. Available at the Mississippi County Courthouse, Blytheville, Arkansas.

Real Estate Tax Records, Osceola. Available at the Mississippi County Courthouse, Osceola, Arkansas.

APPENDIX C

ARTIFACT LIST BY SITE

APPENDIX C

ARTIFACT CATALOGUE OF MATERIALS RECOVERED IN THE DITCHES 10, 12, AND 29, MISSISSIPPI COUNTY, ARKANSAS

This a complete list of the artifacts recovered in this project. Types used are as define in Kaczor et al. 1983, Lafferty et al. 1981, and Futato 1983.

LIST OF ABBREVIATIONS

Abrad - Abrader
Albalb - Albany slip, interior and exterior
Albbrs - Albany and bristol slipped
Albsal - Albany and salt glaze slipped
Alboth - Albany and other unidentified slip
Albun - Albany slip and unglazed
Abort - Aborted during manufacture.
Alum - Aluminum
Aluvcob - Cobble or gravel worn by alluvial action.
Ammo - Historic ammunition.
Anim - Animal remains.
Barbwi - Barbed wire
Bat - Battered
Batcor - Battery core
Bcap - Bottle cap
Bdbase - Pottery fragment with parts of body and base present.
Bifk - Biface.
Bneck - Bottleneck
Bodyfg - Ceramic body sherd less than 1/2" maximum dimension.
Brsbrs - Bristol slip interior and exterior
Brsoth -Bristol and other unidentified slip
Bthin - Bifacial thinning flake.
Cal - Calcified.
Canc - Cannel coal
Cg - Chipped and ground lithic
Chaa- Celt-hoe-axe
Charc - Charcoal.
Chnk - Chunk
Chop - Chopper.
CL - Chipped lithic
Cm - Centimeter.
Cobl - Cobble
Cobbrs - Cobalt blue and Bristol slip
Cobcob - Cobalt blue interior and exterior
Conc - Concretion
Cong - Conglomerate
Cncrete - Concrete
Cornt - Corner notched
Cpoly - Clear, polychrome
Cri - Cord-impressed

LIST OF ABBREVIATIONS

Crmk - Cord-marked
Crscnt - Crescent
Crt - Chert.
Crt-brec - Chert breccia.
Ctx - Cortex on platform
Cylind - Cylindrical in shape.
Dbrn - Dark brown
Deb - Pottery manufacturing debris
Dec - Decorated
Decal - Decalcomania
Decort - Decortication flake.
Dent - Denticulate.
Ds - Distal.
Earth - Earthenware
Engra - Engraved
Eucer - European ceramic
EU - Excavation Unit.
Exhaus - Exhausted core.
Expnst - Expanding stemmed
Fc - Fire cracked rock
Fclay - Fired clay.
Fers - Ferrous metal
Fig - Figurine
Fing - Fingernail punctate
Fla - Flake.
Flor - Floral remains.
Flot - Flotation sample.
Fossi - Fossil fuel derived
Fr - Fragment.
Grad - Granitoid
Graph - Graphite
Grav - Gravel
Grip - Grinding, pounding tool
Grl - Groundstone lithic
Grosan - Ground and sand tempering
Grosh - Grog and shell tempering.
Gshell - Gun shell.
Ham - Hammerstone
Hbolt - Hex head bolt
Hem - Hematite
Hlith - Historic lithic
Hpaint - Hand painted
HT - Heated
Inci - Incised
Ind - Indeterminant
Indun - Indeterminanat glaze and unglazed
Inen - Incised or Engraved
Insul - Insulator
Inter - Interior flake.
Jbase - Jar base
Jlid - Jar lid
Jrim - Jar rim
Lav - Lavender

LIST OF ABBREVIATIONS

Lblue - Light blue
Leath - Leather
Lgrn - Light green
Lim - Limonite
Linm - Linoleum
Linpu - Linear punctate
LS - Limestone
Lunate - byproduct of point notching, semicircular in planview.
Mang - Manganese
Marcom - Complete Makers mark
Marpar - Partial Makers mark
Metobj - Metal object.
Md - Mid-section of projectile point.
Mdir - Multi-directional core, flakes removed in multiple directions from core surface
Mdlobj - Ceramic modeled object
Millcr - Mill Creek
Min - Mineralized
Mjar - Mason jar
Mlid - Mason jar lid
Monog - Monochrome glaze
MPT - Multi-purpose tool.
Nov - Novaculite
Nutbol - Nut with bolt
Octag - Octagonal
Ohist - Other unidentified historic material
Ool - Oolitic chert.
Oqz - Orthoquartzite
Pebl - Pebble
Pewd - Petrified wood
Pebto - Pebble tool.
Pel - Pottery pellet.
Perf - Perforator.
Pigeon - Clay pigeon
Pits - Pitted stone
Plast - Plastic
Polis - Polish
Poly - Polychrome glaze
Porce - Porcelain
Pot - Prehistoric pottery.
Pover - Polychrome overglaze
PPK - Projectile point/knife
PPO - Poverty Point object
Press - Pressed glass
Ptlid - Potlid.
Punct - Punctated
Px - Proximal fragment.
Qzit - Quartzite.
Qtz - Quartz
Qxl - Quartz crystal
Rimfg - Pottery rim fragment (<1.2")
Rtreat - Rim decorative treatment

LIST OF ABBREVIATIONS

Redwar - Rec

RSB - Round ... on base

RUM - Retouched, utilized or modified

Salsal - Salt glaze, interior and exterior

Sbasal - Round seam on basal edge

Scolla - Seam, up to collar

Scr - Scraper.

Shap - Shaped

Shat - Shatter.

Shec - Shell and sand tempered.

Sheqzt - Shell and quartzite tempered.

Shelsa - Shell and sand tempered

Shesag - Shell, sand and grog tempered.

Shing - Shingle

SHL - Soft hammer lip on flake.

Simsp - Simple stamped

Sind - Side and end

Spoks - Spokeshave.

Sqre - Square

Sqbase - Square base

Sshldr - Seam vertical up body and horizontal around shoulder

SS - Sandstone.

St I - Early stage of biface production.

St II - Late stage of biface production.

Stonew - Stoneware

Syn - Synthetic

Table - Tableware

TC - Tested Cobble.

Thimbl - Thimble

Trans - Transfer print

TPT - Toothpaste tube

Undec - Undecorated

Unmod - Unmodified

Upland - Chert from an upland source.

Urm - Unmodified raw material

Wea - Weathered.

TABLE C-1
3MS159 ARTIFACTS

N	E	UNIT	# CT	WT					
210	60	CSC	1	0.3	URM	CHNK	LS		
210	200	CSC	1	1.4	POT		BODY	PLAIN SAND	
215	200	CSC	1	1.1	EARTH		WHITE		
235	200	CSC	1	0.1	FOSSI		COAL		
250	200	CSC	1	0.9	GLASS		CURVE	BROWN	MOLD
250	200	CSC	1	0.8	POT		PEL		
250	200	CSC	4	2.9	POT		BODY	PLAIN SAND	
255	200	CSC	3	4.0	GLASS		CURVE	BROWN	
255	200	CSC	1	0.8	URM	CONC			
260	200	CSC	1	5.3	GLASS		CURVE	BROWN	
260	200	CSC	1	2.4	GLASS		CURVE	CLEAR	
260	200	CSC	2	7.5	GLASS		BNECK	CLEAR	
260	200	CSC	1	5.7	GLASS		BNECK	BROWN	THREAD
260	200	CSC	3	3.4	POT		BODYFG	PLAIN SAND	
265	200	CSC	1	7.0	POT		BODY	CRMK SAND	
265	200	CSC	4	3.3	POT		BODY	PLAIN SAND	
270	200	CSC	2	10.2	GLASS		CURVE	CLEAR	
270	200	CSC	1	1.7	GLASS		CURVE	CLEAR	MOLD
270	200	CSC	2	2.4	GLASS		CURVE	BROWN	
270	200	CSC	1	1.9	POT		BODY	CRMK SAND	WEA
270	200	CSC	1	1.0	POT		BODY	PLAIN SAND	
270	200	CSC	1	0.7	METAL		METOBJ		
275	200	CSC	1	0.3	EARTH		WHITE	BODY	
275	200	CSC	4	3.0	POT		BODYFG	PLAIN SAND	
275	200	CSC	1	0.2	METAL		METOBJ		
280	200	CSC	1	5.4	POT		BASE	PLAIN SAND	
280	200	CSC	3	4.7	POT		BODY	PLAIN SAND	
285	200	CSC	1	3.7	GLASS		CURVE	CLEAR	MOLD
285	200	CSC	1	0.5	GLASS		FLAT	CLEAR	
285	200	CSC	2	3.5	POT		BODY	CRMK SAND	
285	200	CSC	1	2.6	POT		BODY	PLAIN SAND	
285	200	CSC	1	0.4	URM	CHNK	LS		
285	200	CSC	2	0.5	METAL		METOBJ		
290	200	CSC	1	11.2	GLASS		SBASE	CLEAR	
290	200	CSC	1	0.2	GLASS		CURVE	CLEAR	
290	200	CSC	8	12.8	POT		BODY	PLAIN SAND	WEA
295	200	CSC	1	2.7	EARTH		WHITE	RIM	
295	200	CSC	4	6.3	POT		BODY	PLAIN SAND	
295	200	CSC	1	2.9	URM	CHNK	CRT	FC	
295	200	CSC	1	0.3	METAL		METOBJ		
300	200	CSC	2	1.6	GLASS		CURVE	CLEAR	
300	200	CSC	1	0.6	POT		PEL		
305	200	CSC	1	6.5	GLASS		BOTTLE	CLEAR	SNO
305	200	CSC	1	1.2	POT		BODY	PLAIN SAND	
305	200	CSC	1	0.5	POT		PEL		
305	200	CSC	1	0.5	POT		RIMFG	PLAIN SAND	
310	200	CSC	1	3.7	POT		BODY	PLAIN SAND	
310	200	CSC	1	0.3	POT		PEL		

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT					
315	200	CSC	1	3.4	GLASS		CURVE	GREEN	
315	200	CSC	1	2.3	GLASS		CURVE	CLEAR	
315	200	CSC	2	2.8	POT		PEL		
315	200	CSC	2	2.0	POT		RIM	PLAIN SAND	
315	200	CSC	1	0.5	URM	PEBL			
315	200	CSC	1	0.7	FOSSI		IND		
320	200	CSC	1	4.8	POT		BODY	PLAIN SAND	
320	200	CSC	2	0.3	POT		PEL		
320	200	CSC	1	0.6	FOSSI		IND		
325	200	CSC	1	0.5	CL	FLA	DECORT	CRT	
325	200	CSC	2	3.2	GLASS		CURVE	CLEAR	
325	200	CSC	1	1.1	GLASS		CURVE	BROWN	
325	200	CSC	1	1.5	POT		BODY	PLAIN SAND	
330	200	CSC	1	2.9	GLASS		JRIM		
330	200	CSC	1	2.4	POT		BODY	CRMK SAND	WEA
330	200	CSC	5	5.8	POT		BODY	PLAIN SAND	WEA
330	200	CSC	2	1.6	URM	GRAV			
330	200	CSC		6.0	METAL		METOBJ		
335	200	CSC	1	1.8	GLASS		CURVE	CLEAR	
335	200	CSC	4	3.8	POT		BODYFS	PLAIN SAND	
335	200	CSC	1	2.0	URM	GRAV			
340	200	CSC	1	0.4	GLASS		FLAT	CLEAR	
340	200	CSC	1	1.4	GLASS		CURVE	BROWN	
340	200	CSC	1	1.6	GLASS		CURVE	CLEAR	MOLD
340	200	CSC	6	9.8	GLASS		CURVE	CLEAR	
340	200	CSC	4	6.1	POT		BODY	PLAIN SAND	
340	200	CSC	1	429.1	BRICK				
345	200	CSC	1	1.0	EARTH		WHITE	BODY	
345	200	CSC	3	4.5	GLASS		CURVE	CLEAR	
345	200	CSC	1	8.5	GLASS		BBASE	BROWN	MOLD
345	200	CSC	1	2.9	GLASS		CURVE	CLEAR	MOLD
345	200	CSC	1	3.1	GLASS		CURVE	MILK	MOLD
345	200	CSC	5	5.9	POT		BODY	PLAIN SAND	
345	200	CSC	1	1.2	POT		BODY	PLAIN SAND	
345	200	CSC	3	3.1	POT		PEL		
345	200	CSC	2	90.5	METAL		METOBJ		
345	200	CSC	1	1.6	METAL		AMMO	GSHELL	
345	200	CSC	1	2.9	PORCE		TRANS	POLY	
345	200	CSC	1	0.5	FOSSI		IND		
345	205	CSC	2	5.6	GLASS		CURVE	CLEAR	
345	205	CSC	5	5.8	POT		BASE	PLAIN SAND	
345	205	CSC	1	0.4	METAL		METOBJ		
345	210	CSC	1	0.7	CL	FLA	CRT		
345	210	CSC	7	11.0	POT		BODY	PLAIN SAND	
345	215	CSC	7	10.6	POT		BODY	PLAIN SAND	
345	215	CSC	1	0.3	FOSSI		IND		
350	200	CSC	1	0.9	CL	SHAT	CRT	HT	
350	200	CSC	1	3.9	EARTH		WHITE	BODY	

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT					
350	200	CSC	1	0.8	GLASS		FLAT	CLEAR	
350	200	CSC	1	2.7	GLASS		BOTTLE	CLEAR	SLIP
350	200	CSC	6	12.3	GLASS		CURVE	CLEAR	
350	200	CSC	1	0.4	GLASS		FLAT	UNDEC	CLEAR
350	200	CSC	7	7.0	POT		BODY	PLAIN SAND	
350	200	CSC	2	0.6	METAL		METOBJ		
350	200	CSC	1	26.2	STONE		BODY	BRSOTH	
350	200	CSC	2	1.1	FOSSI		IND		
350	200	CSC	1	1.3	FOSSI		COAL		
350	205	CSC	1	0.8	EARTH		WHITE		
350	205	CSC	2	6.7	GLASS		CURVE	CLEAR	
350	205	CSC	1	1.7	GLASS		CURVE	CLEAR	MOLD
350	205	CSC	3	0.3	GLASS		CLEAR		
350	205	CSC	1	0.1	GLASS		BLUE		
350	205	CSC	5	3.9	POT		BODY	PLAIN SAND	
350	205	CSC	1	0.3	FOSSI		IND		
350	210	CSC	1	0.3	GLASS		CURVE	CLEAR	
350	210	CSC	12	7.3	POT		BODY	PLAIN SAND	
350	210	CSC	3	5.4	POT		BODY	CRMK SAND	
350	210	CSC	1	0.3	URM		CANC		
350	215	CSC	1	9.2	GLASS		BBASE	CLEAR	
350	215	CSC	1	0.1	GLASS		CURVE	GREEN	
350	215	CSC	1	0.6	GLASS		CURVE	CLEAR	
350	215	CSC	2	1.9	POT		PEL		
350	215	CSC	4	2.8	POT		BODY	PLAIN SAND	
350	215	CSC	3	14.1	METAL		FENCE		
355	200	CSC	1	2.1	CL	FLA	CRT	CTX	
355	200	CSC	6	18.6	GLASS		CURVE	CLEAR	
355	200	CSC	2	5.2	GLASS		CURVE	BROWN	
355	200	CSC	1	0.3	GLASS		CLEAR		
355	200	CSC	3	4.6	GLASS		SQUARE	CLEAR	
355	200	CSC	3	8.7	GLASS		CURVE	CLEAR	MOLD
355	200	CSC	1	2.5	OHIST		GRAPH	BATCOR	
355	200	CSC	3	3.0	POT		BODY	PLAIN SAND	WEA
355	200	CSC	3	8.1	POT		BODY	CRMK SAND	
355	200	CSC	1	0.1	URM	CONC			
355	200	CSC	1	0.3	URM	CHNK	HEM		
355	200	CSC	1	1.1	METAL		METOBJ		
355	200	CSC	3	3.1	FOSSI		TAR		
360	200	CSC	1	3.2	EARTH		WHITE	BODY	MARPAR
360	200	CSC	1	1.1	GLASS		CURVE	CLEAR	MOLD
360	200	CSC	1	1.6	GLASS		FLAT	CLEAR	
360	200	CSC	1	3.9	GLASS		CURVE	LAV	
360	200	CSC	8	15.8	GLASS		CURVE	CLEAR	
360	200	CSC	1	2.5	GLASS		CURVE	BROWN	MOLD
360	200	CSC	1	0.4	GLASS		MILK		
360	200	CSC	1	0.6	GLASS		CURVE	GREEN	MOLD
360	200	CSC	1	1.8	GLASS		CURVE	BROWN	SEAM

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT							
360	200	CSC	1	7.0	POT		BASE	PLAIN	SAND		
360	200	CSC	10	14.2	POT		BODY	SAND	WEA		
360	200	CSC	2	2.8	POT		BODY	DEC	SAND	WEA	
360	200	CSC	1	0.9	URM	CHNK	HEM				
360	200	CSC	1	0.4	URM	CONC					
360	200	CSC	1	0.4	FOSSI		TAR				
365	200	CSC	2	6.7	EARTH		WHITE	BODY			
365	200	CSC	1	5.8	GLASS		BASE	CLEAR			
365	200	CSC	6	11.5	GLASS		CURVE	CLEAR			
365	200	CSC	1	0.5	GLASS		CLEAR				
365	200	CSC	1	7.0	GLASS		BNECK	CLEAR	MOLD	THREAD	
365	200	CSC	3	12.0	POT		BODY	CRMK	SAND		
365	200	CSC	3	2.4	POT		BODYFG	SAND	WEA		
370	200	CSC	2	3.7	EARTH		WHITE				
370	200	CSC	1	2.0	GLASS		CURVE	CLEAR			
370	200	CSC	1	1.1	GLASS		CURVE	BROWN			
370	200	CSC	3	6.6	POT		BODY	CRMK	SAND		
370	200	CSC	1	0.6	POT		BODY	DEC	SAND	WEA	
370	200	CSC	6	6.8	POT		BODY	SAND	WEA		
370	200	CSC	2	19.8	URM	PEBL					
375	200	CSC	1	0.4	CL	FLA	CRT				
375	200	CSC	1	1.1	EARTH		WHITE				
375	200	CSC	1	1.9	GLASS		CURVE	CLEAR			
375	200	CSC	1	6.4	GLASS		BNECK	COBALT	THREAD	MOLD	
375	200	CSC	1	7.0	GLASS		JRIM	CLEAR	MOLD		
375	200	CSC	4	10.6	POT		BODY	CRMK	SAND		
375	206	CSC	5	4.0	POT		PEL	WEA			
375	200	CSC	5	12.8	POT		BODY	DEC	SAND	WEA	
375	200	CSC	2	1.6	POT		BODY	PLAIN	SHELL		
375	200	CSC	17	23.6	POT		BODY	SAND	WEA		
375	200	CSC	1	0.5	FOSSI		TAR				
375	200	CSC	1	0.3	SYN		PLAST				
380	200	CSC	1	0.6	EARTH		WHITE	RIM	MOLD		
380	200	CSC	1	2.0	GLASS		CURVE	CLEAR			
380	220	CSC	1	5.3	GLASS		CURVE	HPAINT			
380	200	CSC	1	11.9	GLASS		BBASE	CLEAR			
380	200	CSC	1	5.6	GLASS		CURVE	BROWN			
380	200	CSC	7	6.5	POT		PEL				
380	200	CSC	5	16.0	POT		BODY	CRMK	SAND		
380	200	CSC	1	4.5	POT		BASE	CRMK	SAND		
380	200	CSC	37	57.5	POT		BODY	PLAIN	SAND		
380	200	CSC	1	5.5	STONE		ALBBRS				
380	200	CSC	2	3.1	FOSSI		COAL				
380	200	CSC	3	1.2	FOSSI		IND				
385	200	CSC	1	5.4	CL	BLADE	SIDE	RUM	CRT	CTX	
385	200	CSC	2	4.4	EARTH		WHITE	BODY			
385	200	CSC	1	10.7	EARTH		WHITE	BODY	BANDED	PINK	BLUE
385	200	CSC	1	1.7	GLASS		CURVE	GREEN	MOLD		

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT						
385	200	CSC	12	21.0	GLASS		CURVE	CLEAR		
385	200	CSC	3	6.0	GLASS		CURVE	BROWN		
385	200	CSC	1	0.7	GLASS		CURVE	MILK		
385	200	CSC	1	2.9	GLASS		BASE	CLEAR		
385	200	CSC	1	6.2	GLASS		BNECK	CLEAR	SLIP	
385	200	CSC	7	4.8	POT		PEL			
385	200	CSC	46	72.9	POT		BODY	PLAIN	SAND	
385	200	CSC	7	15.8	POT		BODY	CRMK	SAND	
385	200	CSC	1	3.2	POT		RIM	CRMK	SAND	
385	200	CSC	2	2.0	POT		BODY	PLAIN	SAND	
385	200	CSC	9	4.8	FOSSI		IND			
390	200	CSC	1	0.6	CL	FLA	DECORT	CRT	CTX	
390	200	CSC	2	5.5	EARTH		WHITE			
390	200	CSC	1	0.1	GLASS		CURVE	MILK		
390	200	CSC	3	4.5	GLASS		CURVE	BROWN	MOLD	
390	200	CSC	2	4.0	GLASS		CURVE	CLEAR		
390	200	CSC	1	6.0	GLASS		JRIM	CLEAR		
390	200	CSC	1	10.2	GLASS		CURVE	PAINT	CLEAR	
390	200	CSC	2	12.8	GLASS		BASE			
390	200	CSC	1	1.5	POT		PEL			
390	200	CSC	19	27.7	POT		BODY	PLAIN	SAND	
390	200	CSC	1	1.5	POT		BODY	PLAIN	GROG	
390	200	CSC	1	1.1	POT		PEL	GROSAN		
390	200	CSC	8	4.0	METAL		METOBJ			
390	200	CSC	1	0.2	FOSSI		IND			
395	200	CSC	1	0.8	EARTH		WHITE	RIM		
395	200	CSC	3	3.9	EARTH		WHITE	BODY		
395	200	CSC	1	3.9	GLASS		JRIM	MJAR	CLEAR	
395	200	CSC	14	32.8	GLASS		CURVE	CLEAR		
395	200	CSC	2	2.4	GLASS		CURVE	SODAB	BROWN	
395	200	CSC	2	17.4	GLASS		BBASE	CLEAR		
395	200	CSC	1	4.4	GLASS		JBASE	MILK	GREEN	
395	200	CSC	1	2.5	GLASS		CURVE	SODAB	PAINT	
395	200	CSC	1	4.8	POT		BARNES	BODYFG	CRMK	SAND
395	200	CSC	10	14.5	POT		BARNES	BODYFG	PLAIN	SAND
395	200	CSC	1	0.7	SYN		PLAST			
395	205	CSC	2	5.2	EARTH		WHITE	RIM		
395	205	CSC	4	7.3	EARTH		WHITE	BODY		
395	205	CSC	1	3.5	EARTH		WHITE	BASE		
395	205	CSC	1	7.5	GLASS		SODAB	CLEAR		
395	205	CSC	1	1.2	GLASS		CURVE	MILK	GREEN	
395	205	CSC	2	4.1	GLASS		CURVE	LGRN		
395	205	CSC	12	16.9	GLASS		CURVE	CLEAR		
395	205	CSC	1	1.3	GLASS		CURVE	LBLUE		
395	205	CSC	1	0.2	GLASS		CURVE	MILK		
395	205	CSC	1	10.1	GLASS		BNECK	CLEAR	STOPPE	
395	205	CSC	1	6.4	GLASS		BASE	CLEAR	PRESS	
395	205	CSC	1	2.5	GLASS		FLAT	CLEAR		

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT					
395	205	CSC	1	12.1	GLASS	CURVE	CLEAR	MOLD	
395	205	CSC	1	4.6	OHIST	GRAPH	BATCOR		
395	205	CSC	1	0.7	POT	PEL			
395	205	CSC	1	3.2	POT	RIM	PLAIN	SAND	
395	205	CSC	14	26.4	POT	BODY	PLAIN	SAND	
395	205	CSC	3	3.6	POT	BODY	CRMK	SAND	
395	205	CSC	1	1.2	SHELL				
395	205	CSC	3	4.2	URM	CANC			
395	205	CSC	1	15.8	PORCE	TABLE			
395	205	CSC	1	14.5	BRICK				
395	205	CSC	6	4.0	FOSSI	IND			
395	210	CSC	1	2.4	CL FLA	DECORT	CRT		
395	210	CSC	1	1.0	GLASS	FLAT	CLEAR		
395	210	CSC	1	2.5	GLASS	CURVE	CLEAR		
395	210	CSC	11	20.0	POT	BODY	PLAIN	SAND	
395	210	CSC	3	36.6	METAL	METOBJ			
395	215	CSC	2	0.5	POT	BODY	PLAIN	SAND	
395	220	CSC	1	2.6	EARTH	WHITE			
395	220	CSC	1	4.5	EARTH	WHITE	DECAL		
395	220	CSC	3	5.6	GLASS	CURVE	CLEAR	MOLD	
395	220	CSC	1	1.5	GLASS	CURVE	CLEAR		
395	220	CSC	1	0.4	GLASS	FLAT	CLEAR		
395	220	CSC	1	1.3	GLASS	CURVE	BROWN		
395	220	CSC	1	1.0	POT	BODY	CRMK	SAND	
395	220	CSC	5	5.6	POT	BODY	PLAIN	SAND	WEA
400	200	CSC	1	1.9	EARTH	WHITE	RIM	RTREAT	MOLD
400	200	CSC	3	1.6	EARTH	WHITE	BODY		
400	200	CSC	1	4.0	EARTH	WHITE	RIM		
400	200	CSC	21	26.9	GLASS	CURVE	CLEAR		
400	200	CSC	2	1.1	GLASS	FLAT	CLEAR		
400	200	CSC	1	9.8	GLASS	BBASE	CLEAR	EMBOSS	
400	200	CSC	2	10.4	GLASS	BNECK	CLEAR	MOLD	
400	200	CSC	1	0.1	GLASS	CURVE	BLUE		
400	200	CSC	2	1.0	GLASS	CURVE	MILK	GREEN	MOLD
400	200	CSC	1	1.4	GLASS	RIM	CLEAR	MOLD	
400	200	CSC	1	0.9	GLASS	CURVE	CLEAR	MOLD	PAINT
400	200	CSC	3	7.8	GLASS	CURVE	CLEAR	MOLD	
400	200	CSC	1	19.4	GLASS	BBASE	CLEAR	EMBOSS	
400	200	CSC	2	4.5	GLASS	CURVE	BROWN	MOLD	
400	200	CSC	1	5.7	GLASS	CURVE	CLEAR	SEAM	
400	200	CSC	1	7.5	GLASS	BBASE	CLEAR		
400	200	CSC	2	4.1	GLASS	CURVE	CLEAR	MOLD	
400	200	CSC	1	9.1	GLASS	BBASE	CLEAR	MOLD	
400	200	CSC	24	27.7	POT	BODY	PLAIN	SAND	
400	200	CSC	3	15.0	POT	BODY	CRMK	SAND	
400	200	CSC	3	0.3	URM	IND			
400	200	CSC	7	11.1	METAL	METOBJ			
400	200	CSC	9	10.5	FOSSI	IND			

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT						
400	205	CSC	1	13.6	CL	FLA	DECORT	RUM	QZIT	
400	205	CSC	1	2.0	EARTH		WHITE	RIM	RTREAT	MOLD
400	205	CSC	1	3.2	EARTH		WHITE			
400	205	CSC	1	4.3	EARTH		WHITE	BASE		
400	205	CSC	1	6.3	GLASS		BNECK	CLEAR	THREAD	
400	205	CSC	1	1.3	GLASS		CURVE	LGRN		
400	205	CSC	1	3.6	GLASS		BNECK	CLEAR	SLIP	
400	205	CSC	1	9.1	GLASS		SQUARE	CLEAR		
400	205	CSC	3	16.6	GLASS		CURVE	PAINT		
400	205	CSC	6	10.3	GLASS		CURVE	CLEAR		
400	205	CSC	1	1.2	POT		RIM	CRMK	SAND	
400	205	CSC	1	1.8	POT		BODY	DEC	SAND	WEA
400	205	CSC	10	13.3	POT		BODY	PLAIN	SAND	
400	205	CSC	1	1.0	URM		CANC			
400	205	CSC	1	80.5	METAL		FERS	TAC		
400	205	CSC	6	3.3	FOSSI		IND			
400	210	CSC	1	0.2	CL	FLA	CRT			
400	210	CSC	1	35.0	EARTH		BODY	ALBALB		
400	210	CSC	1	0.5	GLASS		BROWN	MOLD		
400	210	CSC	1	18.1	GLASS		BASE	CLEAR	MOLD	
400	210	CSC	1	5.7	GLASS		CURVE	CLEAR	MOLD	
400	210	CSC	1	2.2	GLASS		CURVE	BROWN		
400	210	CSC	19	29.5	POT		BODY	SAND	WEA	
400	210	CSC	1	0.6	POT		BODY	CRMK	SAND	
400	210	CSC	2	2.2	POT		BODY	DEC	SAND	WEA
400	210	CSC	4	5.2	URM	CONC				
400	210	CSC	1	16.0	URM	CHNK	QZIT			
400	215	CSC	2	1.8	GLASS		CURVE	CLEAR		
400	215	CSC	1	3.4	POT		BODY	CRMK	SAND	
400	215	CSC	4	2.7	POT		BODY	PLAIN	SAND	
400	220	CSC	1	1.8	GLASS		CURVE	BROWN		
400	220	CSC	8	7.5	POT		BODY	PLAIN	SAND	
405	200	CSC	1	1.4	EARTH		WHITE	BODY		
405	200	CSC	1	5.6	GLASS		BBASE	CLEAR	EMBOSS	
405	200	CSC	1	0.8	GLASS		CURVE	BROWN	MOLD	
405	200	CSC	1	2.5	GLASS		BNECK	CLEAR	MOLD	SLIP
405	200	CSC	1	1.2	GLASS		BNECK	CLEAR	MOLD	
405	200	CSC	1	4.4	GLASS		CURVE	BROWN	MOLD	
405	200	CSC	1	8.8	GLASS		BBASE	CLEAR	EMBOSS	
405	200	CSC	2	10.5	GLASS		CURVE	LGRN		
405	200	CSC	1	45.5	GLASS		BBASE	BROWN	MOLD	
405	200	CSC	1	1.2	GLASS		CURVE	BLUE		
405	200	CSC	1	26.1	GLASS		BBASE	CLEAR	EMBOSS	
405	200	CSC	1	2.9	GLASS		CURVE	CLEAR	PAINT	
405	200	CSC	2	2.6	GLASS		FLAT	CLEAR		
405	200	CSC	1	3.3	GLASS		BBASE	CLEAR	MOLD	
405	200	CSC	2	6.4	GLASS		BASE	CLEAR		
405	200	CSC	25	34.5	GLASS		CURVE	CLEAR		

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT						
405	200	CSC	1	0.8	GLASS		CURVE	BROWN		
405	200	CSC	1	7.1	GLASS		FLAT	CLEAR	EMBOSS	
405	200	CSC	1	0.2	GLASS		RIM	CLEAR		
405	200	CSC	2	2.6	GLASS		CURVE	CLEAR	MOLD	
405	200	CSC	1	3.2	GLASS		CURVE	MILK	MOLD	
405	200	CSC	11	17.0	POT		BODY	PLAIN	SAND	
405	200	CSC	2	6.0	POT		BODY	CRMK	SAND	
405	200	CSC	6	6.0	URM	CONC				
405	200	CSC	4	2.3	METAL		METOBJ			
405	200	CSC	1	40.7	PORCE		INSUL			
405	200	CSC	1	2.2	BRICK					
405	200	CSC	20	23.0	FOSSI		IND			
410	200	CSC	1	1.0	GLASS		RIM	CLEAR	MOLD	
410	200	CSC	1	0.2	GLASS		CLEAR			
410	200	CSC	1	21.4	GLASS		JBASE	MILK	PRESS	EMBOSS
410	200	CSC	1	12.8	GLASS		CURVE	CLEAR	PAINT	
410	200	CSC	1	10.9	GLASS		BOTTLE	MARPAR	LGRN	MOLD
410	200	CSC	1	0.3	GLASS		BROWN			
410	200	CSC	5	11.1	GLASS		CURVE	CLEAR		
410	200	CSC	1	4.0	GLASS		CURVE	GREEN		
410	200	CSC	5	4.2	POT		BODY	PLAIN	SAND	
410	200	CSC	1	3.9	POT		BODY	DEC	SAND	WEA
410	200	CSC	2	1.4	URM	CONC				
410	200	CSC	1	0.8	PORCE		TABLE	TRANS	POLY	
410	200	CSC	3	2.4	FOSSI		TAR			
415	200	CSC	1	1.8	GLASS		BASE	MILK	MOLD	
415	200	CSC	2	5.0	GLASS		CURVE	CLEAR		
415	200	CSC	1	1.2	GLASS		CURVE	CLEAR	MOLD	
420	200	CSC	1	4.9	EARTH		WHITE			
420	200	CSC	1	2.6	GLASS		CURVE	BROWN	MOLD	
420	200	CSC	1	2.5	GLASS		BRIM	CLEAR	MOLD	
420	200	CSC	2	2.0	GLASS		CURVE	CLEAR	MOLD	
420	200	CSC	1	4.0	GLASS		CURVE	CLEAR		
420	200	CSC	1	0.3	POT		BODYFG	SAND		
420	200	CSC	2	2.4	FOSSI		TAR			
425	200	CSC	1	8.4	GLASS		CURVE	CLEAR	MOLD	
425	200	CSC	1	2.4	GLASS		JRIM	CLEAR	MOLD	
425	200	CSC	1	7.7	GLASS		BASE	CLEAR	PRESS	
425	200	CSC	1	21.6	GLASS		BASE	BROWN	EMBOSS	MARCOM
425	200	CSC	2	2.2	POT		BODY	PLAIN	SAND	
425	200	CSC	1	1.4	POT		BODY	PLAIN	GROG	
430	200	CSC	3	3.8	GLASS		FLAT	CLEAR		
435	200	CSC	1	0.7	GLASS		FLAT	CLEAR	MOLD	
435	200	CSC	1	1.1	GLASS		CURVE	CLEAR		
435	200	CSC	1	0.9	GLASS		FLAT	CLEAR		
435	200	CSC	1	2.2	GLASS		CURVE	CLEAR	MOLD	
435	200	CSC	2	1.7	POT		BODY	SAND	WEA	
435	200	CSC	2	0.6	URM	CONC				

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT					
435	200	CSC	3	1.3	FOSSI		IND		
440	200	CSC	1	2.6	POT		BODY	SAND	WEA
445	200	CSC	1	108.2	METAL		METOBJ		
445	205	CSC	2	1.1	POT		BODY	PLAIN	SAND
445	210	CSC	2	3.1	POT		BODY	PLAIN	SAND
445	210	CSC	1	3.2	POT		RIM	PLAIN	SAND
445	215	CSC	6	5.9	POT		BODY	PLAIN	SAND
445	220	CSC	1	0.5	POT		BODY	PLAIN	SAND
445	225	CSC	1	1.2	GLASS		FLAT	CLEAR	
445	225	CSC	1	0.5	POT		BODY	PLAIN	SAND
450	200	CSC	1	0.3	GLASS		CURVE	CLEAR	
450	200	CSC	1	1.2	GLASS		BBASE	CLEAR	
450	200	CSC	5	7.5	POT		BODY	SAND	WEA
450	200	CSC	1	9.8	METAL		METOBJ		
450	200	CSC	1	0.6	SYN		RUBBER		
450	205	CSC	1	1.0	GLASS		FLAT	CLEAR	
450	205	CSC	2	1.9	POT		BODY	PLAIN	SAND
450	210	CSC	1	1.1	GLASS		CLEAR		
450	210	CSC	1	1.0	POT		BODY	PLAIN	SAND
450	210	CSC	1	1.4	POT		BODY	CRMK	SAND
450	215	CSC	1	2.3	POT		BODY	PLAIN	SAND
450	220	CSC	4	5.6	POT		BODY	PLAIN	SAND
450	220	CSC	1	2.1	POT		BODY	CRMK	SAND
450	225	CSC	1	5.6	GLASS		CURVE	COBALT	
450	225	CSC	1	1.1	POT		BODY	PLAIN	SAND
455	200	CSC	5	6.1	POT		BODY	SAND	WEA
455	200	CSC	1	0.1	METAL		METOBJ		
460	200	CSC	1	0.2	GLASS		FLAT	BROWN	
460	200	CSC	7	5.4	POT		BODY	SAND	WEA
460	200	CSC	3	4.4	POT		BODY	DEC	SAND	WEA
460	200	CSC	2	0.6	POT		BODYFG	SAND	
460	200	CSC	1	0.7	POT		BODY	CRMK	SAND
460	200	CSC	2	0.8	URM	CONC			
465	200	CSC	1	0.2	GLASS		BBASE	CLEAR	
465	200	CSC	1	0.8	GLASS		CURVE	BROWN	
465	200	CSC	25	21.8	POT		BODY	SAND	WEA
465	200	CSC	3	6.0	POT		BODY	CRMK	SAND
470	200	CSC	2	5.0	GLASS		CURVE	BROWN	
470	200	CSC	1	0.1	GLASS		CLEAR	FR	
470	200	CSC	1	7.6	GLASS		BASE	CLEAR	
470	200	CSC	1	3.1	GLASS		CURVE	CLEAR	
470	200	CSC	1	1.6	GLASS		FLAT	CLEAR	
470	200	CSC	2	5.2	POT		BODY	CRMK	SAND
470	200	CSC	1	1.7	POT		BODY	PUNCT	SAND	WEA
470	200	CSC	2	0.8	POT		BODY	CRMK	SAND	WEA
470	200	CSC	18	23.2	POT		BODY	SAND	WEA
470	200	CSC	1	6.5	URM	PEBL			
470	200	CSC	1	0.4	URM	CHNK	SS	WEA	

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT						
473	206	CSC	1	0.3	URM	CONC				
475	200	CSC	1	2.5	CL	FLA	CRT			
475	200	CSC	1	1.0	GLASS		FLAT	CLEAR		
475	200	CSC	1	1.9	GLASS		CURVE	CLEAR		
475	200	CSC	11	17.0	POT		BODY	PLAIN	SAND	
475	200	CSC	1	1.5	POT		BODY	SIMSP	SAND	
475	200	CSC	8	22.2	POT		BODY	CRMK	SAND	
475	200	CSC	1	0.4	FOSSI		IND			
480	200	CSC	8	10.3	POT		BODY	PLAIN	SAND	
480	200	CSC	1	4.3	POT		BODY	PUNCT	SAND	
480	200	CSC	7	21.1	POT		BODY	CRMK	SAND	
485	200	CSC	1	3.4	POT		BODY	CRMK	SAND	
485	200	CSC	1	2.6	POT		BODY	PLAIN	SAND	
485	200	CSC	3	9.9	POT		BODY	PLAIN	SAND	
490	200	CSC	1	3.6	POT		BODY	CRI	SAND	
490	200	CSC	1	0.8	POT		BODY	PLAIN	GROG	
490	200	CSC	2	3.1	POT		BODY	PLAIN	SAND	
495	100	CSC	2	1.6	POT		BODY	PLAIN	SAND	
495	105	CSC	1	0.2	ANIM		BONE	FR		
495	105	CSC	1	1.1	POT		BODY	PLAIN	SAND	
495	105	CSC	1	4.3	POT		BODY	PUNCT	SAND	WEA
495	110	CSC	1	4.9	POT		BODY	PLAIN	SHELSA	
495	110	CSC	1	0.4	POT		BODY	PLAIN	SAND	
495	110	CSC	2	1.8	URM	PEBL	SS			
495	115	CSC	1	0.4	POT		BODY	PLAIN	SAND	
495	120	CSC	1	2.0	CL	SHAT	QZIT			
495	120	CSC	1	0.4	POT		RIM	PLAIN	SAND	
495	120	CSC	1	0.5	POT		BODY	PLAIN	SAND	
495	120	CSC	5	2.6	URM	PEBL	SS			
495	125	CSC	2	1.2	POT		BODY	PLAIN	SAND	
495	125	CSC	2	1.1	URM	PEBL	SS			
495	130	CSC	1	0.7	POT		BODY	PLAIN	SAND	
495	135	CSC	1	0.7	POT		BASE	PLAIN	SAND	
495	135	CSC	2	2.8	POT		BODY	PLAIN	SAND	
495	140	CSC	1	0.8	POT		BODY	PLAIN	SAND	
495	140	CSC	1	0.6	URM	PEBL	SS			
495	150	CSC	1	1.9	POT		BODY	CRMK	SAND	
495	150	CSC	2	0.6	URM	PEBL	SS			
495	150	CSC	1	0.8	FOSSI		IND			
495	155	CSC	3	11.5	POT		BODY	PLAIN	SAND	
495	155	CSC	1	2.2	POT		BODY	CRMK	SAND	
495	160	CSC	3	4.2	POT		BODY	PLAIN	SAND	
495	165	CSC	1	1.6	POT		BODY	DEC	SAND	WEA
495	165	CSC	2	0.7	POT		BODY	PLAIN	SAND	
495	170	CSC	1	5.1	POT		BODY	PLAIN	SAND	
495	175	CSC	6	5.9	POT		BODY	PLAIN	SAND	
495	175	CSC	1	0.1	URM		OXL			
495	175	CSC	1	0.1	URM	CONC				

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT	#	CT	WT						
495	175	CSC		4	1.1	URM	PEBL	SS			
495	180	CSC		1	1.5	GLASS		CURVE	GREEN		
495	180	CSC		2	3.6	POT		BODY	PLAIN SAND		
495	200	CSC		4	3.6	POT		BODY	PLAIN SAND		
495	200	CSC		1	6.0	POT		BODY	PLAIN GROS		
		GENE		2	4.0	ANIM		BONE			
		1X1M	1	1	0.3	CL	FLA	CRT			
		1X1M	1	1	0.2	CL	SHAT	CRT			
		GENE		1	1.1	CL	SHAT	CRT			
		1X1M	1	1	0.3	CL	FLA	CRT			
		GENE		1	7.2	CL	FLA	RUM	CRT		
		GENE		1	9.9	CL	FLA	DECORT	CRT		
		GENE		1	1.9	EARTH		WHITE	BODY		
		GENE		1	7.1	EARTH		WHITE	BASE		
		GENE		1	3.1	EARTH		WHITE	BODY		
		1X1M	1	1	0.7	EARTH		WHITE			
		1X1M	1	1	10.3	EARTH		WHITE	BANDED	PINK	BLUE
		GENE		1	2.2	EARTH		WHITE	RIM		
		GENE		1	4.5	EARTH		WHITE	BASE		
		1X1M	1	1	0.1	EARTH		WHITE			
		GENE		1	2.9	EARTH		ALBALB			
		GENE		1	5.2	EARTH		WHITE	BODY		
		1X1M	1	1	1.0	FLOR		CHARC			
		1X1M	1	1	28.0	GLASS		BBASE	CLEAR		
		1X1M	1	10	13.1	GLASS		CURVE	CLEAR		
		GENE		1	16.9	GLASS		SQUARE	RED		
		1X1M	1	1	1.0	GLASS		PAINT	CLEAR		
		1X1M	1	1	0.1	GLASS		BROWN			
		1X1M	1	1	1.5	GLASS		CURVE	PAINT	CLEAR	MOLD
		1X1M	1	6	3.6	GLASS		CURVE	CLEAR		
		1X1M	1	2	0.8	GLASS		CURVE	BROWN		
		1X1M	1	1	1.5	GLASS		CLEAR	MOLD		
		1X1M	1	2	4.7	GLASS		CURVE	BROWN		
		1X1M	1	1	2.0	GLASS		RIM	MOLD	AQUA	
		GENE		12	25.8	GLASS		CURVE	CLEAR		
		GENE		2	2.6	GLASS		JRIM	CLEAR		
		GENE		1	5.2	GLASS		MARBLE			
		GENE		2	9.2	GLASS		BASE	CLEAR		
		GENE		1	0.9	GLASS		CURVE	CLEAR		
		GENE		1	1.7	GLASS		CURVE	BROWN		
		GENE		2	6.1	GLASS		JRIM	BLUE		
		GENE		2	5.8	GLASS		CURVE	LGRN		
		1X1M	1	1	13.3	POT		RIM	PLAIN SAND		
		1X1M	1	16	65.4	POT		DEB	SAND		
		1X1M	1	40	71.3	POT		BODY	PLAIN SAND		
		1X1M	1	5	36.3	POT		BODY	DEC	SAND	
		1X1M	1	15	95.8	POT		BODY	CRMK	SAND	
		1X1M	1	9	17.4	POT		PEL			

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT					
		1X1M 1	1	13.7	POT	FIG	ZOO	SAND	
		1X1M 1	1	21.8	POT	RIM	PLAIN	SAND	
		1X1M 1	2	1.7	POT	PEL	PLAIN		
		1X1M 1	80	64.7	POT	BODY	SAND	WEA	
		1X1M 1	2	6.3	POT	DAUB			
		1X1M 1	1	6.1	POT	DEB	SAND		
		1X1M 1	9	23.0	POT	BODY	DEC	SAND	WEA
		1X1M 1	1	5.2	POT	RIM	CRMK	SAND	
		1X1M 1	1	3.0	POT	RIM	DEC	SAND	WEA
		1X1M 1	11	36.8	POT	BODY	CRMK	SAND	
		1X1M 1	17	105.1	POT	BODY	CRMK	SAND	
		1X1M 1	5	7.5	POT	BODY	PLAIN	SAND	
		GENE	1	0.8	POT	PEL			
		1X1M 1	11	109.5	POT	BODY	CRMK	SAND	
		1X1M 1	1	11.9	POT	DEB	SAND		
		1X1M 1	2	25.3	POT	DEB	SAND		
		GENE	10	22.7	POT	BODY	PLAIN	SAND	
		1X1M 1	5	60.4	POT	DAUB			
		1X1M 1	1	2.2	POT	DEB	PLAIN	SAND	
		1X1M 1	1	9.4	POT	BODY	PLAIN	SAND	
		GENE	3	7.6	POT	BODY	CRMK	SAND	
		GENE	2	4.1	POT	BODY	CRMK	SAND	
		1X1M 1	1	10.5	POT	BASE	SAND		
		1X1M 1	3	70.4	POT	DAUB			
		1X1M 1	10	35.1	POT	BODY	PLAIN	SAND	
		1X1M 1	1	2.0	POT	RIM	DEC	SAND	WEA
		GENE	4	2.1	POT	PEL			
		1X1M 1	1	15.4	POT	FIG	SAND	WEA	
		GENE	10	16.6	POT	BODY	PLAIN	SAND	
		1X1M 1	1	1.8	POT	DAUB			
		1X1M 1	4	2.3	POT	BODY	SAND	WEA	
		1X1M 1	2	16.0	POT	BODY	PLAIN	SAND	
		1X1M 1	12	66.1	POT	BODY	CRMK	SAND	
		1X1M 1	3	4.0	POT	BODY	PLAIN	SAND	
		1X1M 1	3	1.2	POT	PEL	PLAIN		
		GENE	5	3.4	POT	PEL			
		1X1M 1	1	0.5	POT	RIM	PLAIN	SAND	
		1X1M 1	4	2.0	POT	PEL			
		1X1M 1	69	41.9	POT	BODY	PLAIN	SAND	
		1X1M 1	3	5.9	POT	BODY	CRMK	SAND	
		GENE	2	7.5	POT	BODY	PLAIN	SAND	
		GENE	110	210.9	POT	BODY	PLAIN	SAND	
		GENE	17	38.2	POT	BODY	CRMK	SAND	
		GENE	1	3.0	POT	BODY	TOOL	SAND	
		GENE	21	36.7	POT	BODY	PLAIN	SAND	
		GENE	13	37.9	POT	BODY	CRMK	SAND	
		GENE	1	6.9	POT	BODY	STAMP	SAND	
		1X1M 1	2	1.0	POT	PEL	PLAIN		

TABLE C-1
3MS199 ARTIFACTS

N	E	UNIT #	CT	WT						
		1X1M 1	2	2.5	POT		BODY	CRMK	SAND	WEA
		1X1M 1	1	10.0	POT		RIM	CRMK	SAND	
		1X1M 1	22	21.3	POT		BODY	PLAIN	SAND	
		1X1M 1		0.7	POT		PEL			
		1X1M 1		12.0	POT		BODYFG	PLAIN	SAND	
		1X1M 1	1	9.1	POT		RIM	PLAIN	SAND	
		1X1M 1	50	106.0	POT		BODY	PLAIN	SAND	
		1X1M 1		106.4	POT		BODYFG	SAND		
		1X1M 1	21	57.2	POT		BODY	CRMK	SAND	
		GENE	1	5.6	URM	CHNK	SS			
		GENE	1	0.1	URM		CANC			
		GENE	1	0.5	URM		CANC			
		1X1M 1	1	4.1	URM	CONC				
		1X1M 1	4	3.5	URM	PEBL				
		1X1M 1	5	5.0	URM	CONC				
		GENE	1	3.4	URM	CHNK	CRT			
		1X1M 1		1.9	URM		CANC			
		1X1M 1		0.7	URM		CANC			
		1X1M 1	1	0.3	URM	CONC				
		1X1M 1	2	0.3	URM		IND			
		1X1M 1	1	27.3	URM	PEBL				
		1X1M 1	3	19.2	URM	CONC				
		1X1M 1	2	1.2	URM	PEBL				
		1X1M 1	3	0.7	URM	CONC				
		1X1M 1	1	27.3	URM	PEBL				
		1X1M 1	5	1.0	URM		CANC			
		GENE	1	1.0	URM	PEBL				
		1X1M 1	1	0.0	URM	CONC				
		GENE	2	0.5	METAL		METOBJ			
		GENE	3	2.1	METAL		METOBJ			
		GENE	1	3.5	METAL		ALUM	METOBJ		
		1X1M 1	11	2.1	METAL		METOBJ			
		1X1M 1	2	1.4	METAL		METOBJ			
		1X1M 1	6	2.0	METAL		METOBJ			
		1X1M 1	1	1.7	METAL		TPT			
		GENE	1	2.0	PORCE		BODY			
		GENE	1	22.4	PORCE		RIM	TABLE		
		GENE	1	0.4	FOSSI		IND			
		1X1M 1		19.7	FOSSI		IND			
		1X1M 1		13.5	FOSSI		IND			
		GENE	3	1.0	FOSSI		IND			
		1X1M 1	1	0.2	SYN		PLAST			

Number of artifacts in printout: 618
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 0:5

TABLE C-2. 3MS199 ARTIFACTS FROM TEST UNIT BY DEPTH
****

MINARK D.B.S. V4.0

Database name: ARTFORM
This retrieval performed: 16Apr87 2:31
Data last updated: 16Apr87 1:55
Total artifacts in database with data: 3668
# of artifacts excluded by security rating: 0

Subset name: 199DEPTH # of artifacts in subset: 87

Cumulative selection criteria:
SNO = 3MS199 :
UNIT = 1X1M :

All artifacts selected

—) BDEPTH = 10

1X1M	1	0.00	10.00	3	1.2	POT		PEL	PLAIN		
1X1M	1	0.00	10.00	3	4.0	POT		BODY	PLAIN SAND		
1X1M	1	0.00	10.00	1	0.2	CL	SHAT	CRT			
1X1M	1	0.00	10.00		13.5	FOSSI		IND			
1X1M	1	0.00	10.00	5	1.0	URM		CANC			
1X1M	1	0.00	10.00	4	2.0	POT		PEL			
1X1M	1	0.00	10.00	2	0.3	URM		IND			
1X1M	1	0.00	10.00	69	41.9	POT		BODY	PLAIN SAND		
1X1M	1	0.00	10.00	1	0.5	POT		RIM	PLAIN SAND		
1X1M	1	0.00	10.00	3	5.9	POT		BODY	CRMK SAND		
1X1M	1	0.00	10.00	2	4.7	GLASS		CURVE	BROWN		
1X1M	1	0.00	10.00	1	2.0	GLASS		RIM	MOLD	AQUA	
1X1M	1	0.00	10.00	1	1.5	GLASS		CURVE	PAINT	CLEAR	MOLD
1X1M	1	0.00	10.00	1	28.0	GLASS		BBASE	CLEAR		
1X1M	1	0.00	10.00	10	13.1	GLASS		CURVE	CLEAR		
1X1M	1	0.00	10.00	1	4.1	URM	CONC				
1X1M	1	0.00	10.00	11	2.1	METAL		METOBJ			
1X1M	1	0.00	10.00	1	1.7	METAL		TPT			
1X1M	1	0.00	10.00	1	10.3	EARTH		WHITE	BANDED	PINK	BLUE
1X1M	1	0.00	10.00	1	0.7	EARTH		WHITE			

CT	121.00	6.368	121.00
WT	138.70	6.935	138.70

—) BDEPTH = 14

1X1M	1	10.00	14.00	2	1.0	POT	PEL	PLAIN

TABLE C-2
3MS199 ARTIFACTS FROM TEST UNIT BY DEPTH

UNIT	#	TOP	BOTTM	CT	WT					
1X1M	1	10.20	14.00	1	1.0	FLOR		CHARC		
1X1M	1	10.00	14.00		19.7	FOSSI		IND		
1X1M	1	10.00	14.00	2	2.5	POT		BODY	CRMK SAND	WEA
1X1M	1	10.00	14.00		0.7	POT		PEL		
1X1M	1	10.00	14.00		12.8	POT		BODYFG	PLAIN SAND	
1X1M	1	10.00	14.00	22	21.3	POT		BODY	PLAIN SAND	
1X1M	1	10.00	14.00	1	0.2	SYN		PLAST		
1X1M	1	10.00	14.00	2	0.8	GLASS		CURVE	BROWN	
1X1M	1	10.00	14.00	6	3.6	GLASS		CURVE	CLEAR	
1X1M	1	10.00	14.00	1	0.1	EARTH		WHITE		
1X1M	1	10.00	14.00		0.7	URM		CANC		
1X1M	1	10.00	14.00	1	0.3	URM	CONC			
1X1M	1	10.00	14.00	6	2.0	METAL		METOBJ		

CT	44.00	4.400	165.00
WT	66.70	4.764	205.40

--) BDEPTH = 24

1X1M	1	14.00	24.00	21	57.2	POT		BODY	CRMK SAND
1X1M	1	14.00	24.00	1	9.1	POT		RIM	PLAIN SAND
1X1M	1	14.00	24.00	1	10.0	POT		RIM	CRMK SAND
1X1M	1	14.00	24.00	9	17.4	POT		PEL	
1X1M	1	14.00	24.00		106.4	POT		BODYFG	SAND
1X1M	1	14.00	24.00	50	106.8	POT		BODY	PLAIN SAND
1X1M	1	14.00	24.00	4	3.5	URM	PEBL		
1X1M	1	14.00	24.00	1	0.1	GLASS		BROWN	
1X1M	1	14.00	24.00	1	1.0	GLASS		PAINT	CLEAR
1X1M	1	14.00	24.00	1	1.5	GLASS		CLEAR	MOLD
1X1M	1	14.00	24.00		1.9	URM		CANC	
1X1M	1	14.00	24.00	3	0.7	URM	CONC		
1X1M	1	14.00	24.00	2	1.4	METAL		METOBJ	

CT	94.00	8.545	259.00
WT	317.00	24.385	522.40

-) BDEPTH = 29

1X1M	1	29.00	29.00	1	9.4	POT		BODY	PLAIN SAND

CT	1.00	1.000	260.00
WT	9.40	9.400	531.80

) BDEPTH = 34

TABLE C-2
3MS199 ARTIFACTS FROM TEST UNIT BY DEPTH

UNIT	#	TOP	BOTTM	CT	WT					
1X1M	1	24.00	34.00	2	6.3	POT		DAUB		
1X1M	1	24.00	34.00	68	64.7	POT		BODY	SAND	WEA
1X1M	1	24.00	34.00	2	1.7	POT		PEL	PLAIN	
1X1M	1	24.00	34.20	1	6.1	POT		DEB	SAND	
1X1M	1	24.00	34.00	5	5.8	URM	CONC			
1X1M	1	24.00	34.00	1	0.3	CL	FLA	CRT		
1X1M	1	24.00	34.00	1	13.3	POT		RIM	PLAIN	SAND
1X1M	1	24.00	34.00	9	23.0	POT		BODY	DEC	SAND	WEA
1Y1M	1	24.30	34.00	11	36.8	POT		BODY	CRMK	SAND

CT	112.00	12.444	372.00
WT	158.00	17.556	683.80

--) BDEPTH = 44

UNIT	#	TOP	BOTTM	CT	WT					
1X1M	1	34.00	44.00	3	19.2	URM	CONC			
1X1M	1	34.00	44.00	16	65.4	POT		DEB	SAND	
1X1M	1	34.00	44.00	1	0.3	CL	FLA	CRT		
1X1M	1	34.00	44.00	2	1.2	URM	PEBL			
1X1M	1	34.00	44.00	1	5.2	POT		RIM	CRMK	SAND
1X1M	1	34.00	44.00	17	105.1	POT		BODY	CRMK	SAND
1X1M	1	34.00	44.00	1	3.0	POT		RIM	DEC	SAND	WEA
1X1M	1	34.00	44.00	40	71.3	POT		BODY	PLAIN	SAND
1X1M	1	34.00	44.00	5	36.3	POT		BODY	DEC	SAND

CT	86.00	9.556	458.00
WT	307.00	34.111	996.80

--) BDEPTH = 54

UNIT	#	TOP	BOTTM	CT	WT					
1X1M	1	44.00	54.00	1	8.0	URM	CONC			
1X1M	1	44.00	54.00	3	70.4	POT		DAUB		
1X1M	1	44.00	54.00	1	13.7	POT		FIG	ZOO	SAND
1X1M	1	44.00	54.00	1	15.4	POT		FIG	SAND	WEA
1X1M	1	44.00	54.00	15	95.8	POT		BODY	CRMK	SAND
1X1M	1	44.00	54.00	1	21.8	POT		RIM	PLAIN	SAND
1X1M	1	44.00	54.00	1	2.0	POT		RIM	DEC	SAND	WEA
1X1M	1	44.00	54.00	1	10.5	POT		BASE	SAND	
1X1M	1	55.00	54.00	10	35.1	POT		BODY	PLAIN	SAND

CT	34.00	3.778	492.00
WT	272.70	30.300	1269.50

--) BDEPTH = 64

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT #	CT	WT						
100	200	1X1M 1		15.7	URM	CONC				
175	95	CSC	50	126.0	POT		BODY	CRMK	SAND	
175	95	CSC	14	45.2	POT		BODY	PLAIN	SAND	
175	95	CSC		77.6	POT		BODYFG	PLAIN	SAND	
175	95	CSC		10.0	POT		PEL			
180	95	CSC	1	7.0	URM	CHNK	FC			
180	95	CSC	4	8.5	URM	PEBL				
180	95	CSC	1	0.1	ANIM		BONE	CAL		
180	95	CSC	1	2.4	CL	SHAT	RUM	CRT		
180	95	CSC	12	26.6	POT		BODY	DEC	SAND	WEA
180	95	CSC	1	11.1	POT		RIM	CRMK	SAND	
180	95	CSC	32	79.6	POT		BODY	CRMK	SAND	
180	95	CSC	12	6.9	POT		DAUB			
180	95	CSC	3	2.1	POT		PEL			
180	95	CSC	47	89.2	POT		BODY	PLAIN	SAND	
190	80	CSC	3	9.5	POT		PEL			
190	80	CSC	60	126.3	POT		BODY	PLAIN	SAND	
190	80	CSC	8	23.3	POT		BODY	DEC	SAND	WEA
190	80	CSC	10	11.7	POT		DAUB			
190	80	CSC	1	5.7	GLASS		CURVE	LAV		
190	80	CSC	1	1.3	POT		RIM	CRMK	SAND	
190	80	CSC	1	4.4	GLASS		JRIM	BLUE		
190	80	CSC	16	47.7	POT		BODY	CRMK	SAND	
190	80	CSC	2	0.2	CL	FLA	CRT			
190	80	CSC	2	6.8	URM	PEBL	CRT			
190	80	CSC	1	15.7	CL	BIFK	CRT	FR		
190	80	CSC	1	16.9	CL	BIFK	CRT	FR		
190	80	CSC	1	83.3	GRL		IND	GRAD	FR	
190	95	CSC	30	73.1	POT		BODY	CRMK	SAND	
190	95	CSC		19.7	POT		BODYFG	PLAIN	SAND	
190	95	CSC	6	21.9	URM	PEBL				
190	95	CSC		17.8	POT		BODYFG	DEC	SAND	
190	95	CSC	6	10.9	POT		DAUB			
190	95	CSC	1	2.1	CL	FLA	CRT			
190	95	CSC	1	0.2	URM		MAG			
190	95	CSC	1	1.2	URM	CHNK	SS	WEA		
190	95	CSC	6	30.3	POT		PEL			
190	95	CSC	1	1.4	POT		BODY	PLAIN	SHELL	
190	95	CSC	1	2.2	POT		BODY	CRMK	GROG	
190	95	CSC	8	21.1	POT		BODY	DEC	SAND	WEA
190	95	CSC	1	18.1	POT		BASE	CRMK	PUNCT	SAND
190	95	CSC	1	4.2	POT		RIM	CRMK	SAND	
190	95	CSC	20	47.5	POT		BODY	PLAIN	SAND	
195	50	CSC	5	7.0	POT		BODY	PLAIN	SAND	
195	55	CSC	1	1.1	POT		BODY	DEC	SAND	WEA
195	55	CSC	1	1.3	POT		BODY	PLAIN	SAND	
195	60	CSC	1	5.0	CL	CORE	EXHAUS	CRT		
195	60	CSC	1	1.9	POT		BODY	DEC	SAND	WEA

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT #	CT	WT						
195	60	CSC	5	9.4	POT		BODY	PLAIN	SAND	
195	65	CSC		11.0	POT		PEL			
195	65	CSC	1	2.4	GLASS		CURVE	LAV		
195	65	CSC	18	36.5	POT		BODY	PLAIN	SAND	
195	65	CSC	2	4.6	POT		BODYFG	CRMK	SAND	
195	70	CSC		26.9	POT		BODYFG	PLAIN	SAND	
195	70	CSC	8	36.0	POT		BODY	PLAIN	SAND	
195	70	CSC	9	26.9	POT		BODY	CRMK	SAND	
195	70	CSC	2	0.9	CL	SHAT	CRT			
195	70	CSC	3	2.9	CL	FLA	CRT			
195	75	CSC	1	0.3	POT		BODY	PLAIN	SHELL	
195	75	CSC	10	11.5	POT		DAUB			
195	75	CSC	1	0.8	POT		BODY	RED	FILM	SHELL
195	75	CSC	2	1.0	CL	SHAT	CRT			
195	75	CSC	1	0.8	URM	PEBL	QTZ			
195	75	CSC	1	2.2	POT		RIM	CRMK	SAND	
195	75	CSC	9	2.4	POT		PEL			
195	75	CSC	13	21.8	POT		BODY	DEC	SAND	WEA
195	75	CSC	24	53.7	POT		BODY	CRMK	SAND	
195	75	CSC	45	61.7	POT		BODY	PLAIN	SAND	
195	80	CSC	5	8.3	POT		BODY	DEC	SAND	WEA
195	80	CSC	2	14.6	POT		BASE	PLAIN	SAND	
195	80	CSC	23	47.7	POT		BODY	CRMK	SAND	
195	80	CSC	24	34.0	POT		BODY	PLAIN	SAND	
195	80	CSC	3	2.7	CL	FLA	CRT			
195	80	CSC	1	0.5	URM	PEBL				
195	80	CSC	1	66.6	CL	CORE	HAM	CRT		
195	80	CSC	1	1.8	CL		PPK	CRT	DS	
195	80	CSC	1	14.1	URM	CHNK	CRT	FC		
195	80	CSC	2	4.2	POT		PEL			
195	80	CSC	3	5.4	POT		DAUB			
195	80	CSC	1	53.8	URM	CHNK	SS			
195	80	CSC	1	1.0	POT		BODY	PLAIN	SHELL	
195	85	CSC		33.0	POT		BODYFG	PLAIN	SAND	
195	85	CSC		13.9	POT		DAUB			
195	85	CSC	2	1.4	CL	FLA	CRT			
195	85	CSC	2	7.4	POT		RIM	CRMK	SAND	
195	85	CSC	12	60.8	POT		BODY	CRMK	SAND	
195	85	CSC	2	8.9	POT		BODY	PLAIN	SAND	
195	90	CSC		5.3	POT		PEL			
195	90	CSC		0.5	POT		BODYFG	PLAIN	SHELL	
195	90	CSC		5.4	POT		BODYFG	CRMK	SAND	
195	90	CSC	8	19.9	POT		BODY	CRMK	SAND	
195	90	CSC		11.4	POT		BODYFG	PLAIN	SAND	
195	95	CSC	2	3.4	URM	CHNK	SS			
195	95	CSC	1	5.4	URM	PEBL				
195	95	CSC	1	0.2	POT		BODYFG	PLAIN	SHELL	
195	95	CSC	1	15.1	CL	CHNK	TESTED	FC		

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT	#	CT	WT						
195	95	CSC		1	0.1	CL	FLA	CRT			
195	95	CSC		1	1.0	CL	FLA	DECORT	CRT		
195	95	CSC			42.2	POT		BODYFG	DEC	SAND	
195	95	CSC		8	27.2	POT		BODY	DEC	SAND	WEA
195	95	CSC		27	85.8	POT		BODY	PLAIN	SAND	
195	95	CSC		27	99.5	POT		BODY	CRMK	SAND	
195	95	CSC		2	5.4	POT		RIM	CRMK	SAND	
195	95	CSC			32.4	POT		BODYFG	PLAIN	SAND	
195	95	CSC		4	1.4	POT		PEL			
195	95	CSC		7	22.5	POT		DAUB			
195	100	CSC			1.3	POT		BODYFG	PLAIN	SAND	
195	100	CSC		1	1.1	POT		RIM	RED	SHELL	
195	100	CSC			10.1	POT		BODYFG	DEC	SAND	
195	100	CSC		3	0.9	POT		PEL			
195	100	CSC		5	4.8	POT		DAUB			
195	100	CSC		2	1.1	URM	CHNK	SS			
195	100	CSC		1	1.5	CL	SHAT				
195	100	CSC		1	0.1	FLOR					
195	100	CSC		1	9.4	URM	PEBL				
195	100	CSC		1	1.7	POT		DAUB			
195	100	CSC		1	2.3	FOSSI					
195	100	CSC		1	4.9	POT		BASE	DEC	SAND	WEA
195	100	CSC		41	89.1	POT		BODY	CRMK	SAND	
195	100	CSC		8	19.2	POT		BODY	DEC	SAND	WEA
195	100	CSC		9	15.2	POT		BODY	PLAIN	SAND	
195	105	CSC		1	1.0	POT		PEL			
195	105	CSC		1	4.4	URM	CHNK	CRT	FC		
195	105	CSC		1	0.2	CL	FLA	DECORT	CRT		
195	105	CSC		6	12.2	POT		BODY	CRMK	SAND	
195	105	CSC		7	10.4	POT		BODY	DEC	SAND	WEA
195	105	CSC		12	18.7	POT		BODY	PLAIN	SAND	
200	95	CSC		6	27.6	POT		DAUB			
200	95	CSC			8.5	POT		BODYFG	CRMK	SAND	
200	95	CSC		1	33.4	CL	CORE	MDIR	CRT		
200	95	CSC		2	3.2	CL	FLA	CRT			
200	95	CSC		1	2.6	CL	FLA	RUM	CRT		
200	95	CSC		1	1.5	POT		RIM	PLAIN	SAND	
200	95	CSC		17	53.3	POT		BODY	PLAIN	SAND	
200	95	CSC		19	87.2	POT		BODY	CRMK	SAND	
200	95	CSC			42.2	POT		BODYFG	PLAIN	SAND	
200	95	CSC			16.6	POT		PEL			
200	95	CSC		1	0.6	POT		BODYFG	PLAIN	SHELL	
200	100	1X1M	1	1	1.5	POT		RIM	PUNCT	SHELL	
200	100	1X1M	1	2	0.2	ANIM		UNMOD	BONE		
200	100	1X1M	1	2	2.1	POT		BODY	PLAIN	SHELL	
200	100	1X1M	1	1	2.6	POT		RIM	CRMK	SAND	
200	100	1X1M	1	1	0.3	GLASS		CURVE	CLEAR		
200	100	1X1M	1	21	59.5	POT		BODY	DEC	SAND	WEA

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT	#	CT	WT						
200	100	1X1M	1	52	185.1	POT		BODY	CRMK	SAND	
200	100	1X1M	1	1	1.6	CHIST		IND			
200	100	1X1M	1	3	1.8	CL	FLA	CRT			
200	100	1X1M	1		329.5	POT		BODYFG	PLAIN	SAND	
200	100	1X1M	1	26	65.7	POT		BODY	DEC	SAND	WEA
200	100	1X1M	1		49.6	POT		PEL			
200	100	1X1M	1	5	18.9	POT		DAUB			
200	100	1X1M	1	1	0.7	POT		BODY	PLAIN	SAND	
200	100	1X1M	1	1	2.7	POT		DEB			
200	100	1X1M	1	21	61.2	POT		BODY	PLAIN	SAND	
200	100	1X1M	1	48	136.6	POT		BODY	CRMK	SAND	
200	200	1X1M	1	2	0.4	ANIM		BONE			
205	95	CSC		18	52.6	POT		BODY	CRMK	SAND	
205	95	CSC		1	3.5	URM	CHNK	CRT	FC		
205	95	CSC		4	2.6	CL	FLA	CRT			
205	95	CSC			7.1	POT		DAUB			
205	95	CSC			9.1	POT		PEL			
205	95	CSC		32	49.5	POT		BODY	PLAIN	SAND	
205	95	CSC		1	1.7	POT		RIM	CRMK	SAND	
210	50	CSC		1	1.7	POT		BODY	DEC	SAND	WEA
210	50	CSC		1	0.8	POT		BODY	SAND	WEA	
210	55	CSC		1	3.0	URM	CHNK	SS			
210	55	CSC		1	0.1	URM	CHNK	QZIT			
210	55	CSC		1	6.1	METAL		FERS			
210	55	CSC		1	0.2	POT		PEL			
210	55	CSC		2	4.7	POT		BODY	CRMK	SAND	
210	55	CSC		1	1.2	POT		BODY	DEC	SAND	WEA
210	55	CSC		4	8.6	POT		BODY	PLAIN	SAND	
210	60	CSC		6	16.9	POT		BODY	CRMK	SAND	
210	60	CSC		14	21.2	POT		BODY	PLAIN	SAND	
210	60	CSC		1	1.8	POT		BODY	DEC	SAND	WEA
210	60	CSC		1	0.3	POT		BODY	PLAIN	SHELL	
210	60	CSC		1	0.3	CL	FLA	DECCRT	CRT		
210	60	CSC		1	0.3	POT		PEL			
210	60	CSC		1	19.0	POT		DAUB			
210	60	CSC		1	0.1	METAL		FERS			
210	60	CSC		1	5.9	CL	FLA	CRT			
210	65	CSC			12.0	POT		BODYFG	PLAIN	SAND	
210	65	CSC			1.6	POT		PEL			
210	65	CSC		2	6.2	POT		BODY	PLAIN	SAND	
210	65	CSC		3	11.1	POT		BODY	CRMK	SAND	
210	70	CSC		3	9.4	POT		BODY	PLAIN	SAND	
210	70	CSC		1	1.2	CL	SHAT				
210	70	CSC			4.0	POT		PEL			
210	70	CSC			21.7	POT		BODYFG	PLAIN	SAND	
210	70	CSC		9	24.4	POT		BODY	CRMK	SAND	
210	75	CSC		1	0.1	POT		RIMFG	PLAIN	SAND	
210	75	CSC		1	0.1	POT		BODYFG	PLAIN	SHELL	

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT	# CT	WT						
210	75	CSC		4.3	POT		PEL			
210	75	CSC	7	24.0	POT		BODY	CRMK	SAND	
210	75	CSC	6	19.6	POT		BODY	PLAIN	SAND	
210	75	CSC		18.6	POT		BODYFG	PLAIN	SAND	
210	80	CSC	2	0.5	CL	FLA	LUNA	CRT		
210	80	CSC	2	1.1	CL	SHAT	CRT			
210	80	CSC	12	30.1	POT		BODY	CRMK	SAND	
210	80	CSC		8.6	POT		PEL			
210	80	CSC	11	31.8	POT		BODY	PLAIN	SAND	
210	80	CSC		27.4	POT		BODYFG	PLAIN	SAND	
210	80	CSC	2	36.7	POT		DAUB			
210	85	CSC	16	39.7	POT		BODY	CRMK	SAND	
210	85	CSC	6	13.1	POT		BODY	PLAIN	SAND	
210	85	CSC	1	0.3	CL	FLA	DECORT	CRT	HT	
210	85	CSC	1	0.2	ANIM		BONE	CAL		
210	85	CSC	1	0.9	CL	FLA	RUM	CRT	HT	
210	85	CSC	1	2.8	CL	SHAT	CRT			
210	85	CSC	1	0.5	CL	FLA	PREFOR	RUM	CRT	
210	85	CSC	2	13.2	URM	CHNK	WEA			
210	85	CSC	1	0.8	POT		BODY	FILM	RED	SHELL
210	85	CSC	5	9.1	POT		BODY	DEC	SAND	WEA
210	85	CSC	3	5.5	POT		PEL			
210	85	CSC	3	9.9	URM	PEBL				
210	85	CSC	2	0.8	POT		DAUB			
210	90	CSC	5	4.8	POT		BODY	DEC	SAND	WEA
210	90	CSC	7	12.9	POT		BODY	CRMK	SAND	
210	90	CSC	1	1.5	CL	FLA	CRT			
210	90	CSC	6	5.5	POT		BODY	PLAIN	SAND	
210	90	CSC	1	6.1	POT		BASE	CRMK	SAND	
210	90	CSC	1	0.7	POT		BODY	PLAIN	SAND	
210	90	CSC	1	2.2	POT		RIM	PLAIN	SHELL	
210	90	CSC	2	1.7	POT		DAUB			
210	90	CSC	1	0.9	POT		PEL			
210	95	CSC	1	6.2	CL	FLA	CRT			
210	95	CSC		11.2	STONE		ALBBRS			
210	95	CSC	1	0.2	CL	CORE	NOV	HT	FR	
210	95	CSC	1	5.8	URM	PEBL				
210	95	CSC	2	3.4	CL	FLA	NOV	HT		
210	95	CSC	1	0.6	URM	CONC				
210	95	CSC	8	8.7	POT		BODY	PLAIN	SAND	
210	95	CSC	9	15.1	POT		BODY	CRMK	SAND	
210	95	CSC	1	1.1	POT		BODY	DEC	SAND	WEA
210	95	CSC	2	0.5	POT		PEL			
210	95	CSC	1	0.7	POT		BODY	PLAIN	SHELL	
210	95	CSC	1	0.8	POT		PEL			
210	95	CSC	18	70.8	POT		BODY	CRMK	SAND	
210	95	CSC	14	28.6	POT		BODY	PLAIN	SAND	
210	95	CSC	6	7.7	POT		DAUB			

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT #	CT	WT						
210	95	CSC	5	6.6	POT		BODY	DEC	SAND	WEA
210	100	CSC	4	4.9	CL	FLA	CRT			
210	100	CSC	1	2.3	CL		ARROW	PREFOR	OOZ	
210	100	CSC	1	6.3	CL	SHAT	CRT			
210	100	CSC	1	18.6	POT		DAUB			
210	100	CSC		42.6	POT		BODYFG	PLAIN	SAND	
210	100	CSC		4.0	POT		PEL			
210	100	CSC	3	10.6	POT		BODY	PLAIN	SAND	
210	100	CSC	11	42.1	POT		BODY	CRMK	SAND	
210	105	CSC		42.9	POT		BODYFG	PLAIN	SAND	
210	105	CSC		4.1	POT		PEL			
210	105	CSC	2	0.1	URM	PEBL				
210	105	CSC	1	0.8	ANIM		BONE			
210	105	CSC	1	0.1	POT		BODY	PLAIN	SHELL	
210	105	CSC	1	0.5	CL	FLA	BTHIN	POLISH	MILLCR	
210	105	CSC	3	23.1	POT		RIM	CRMK	SAND	
210	105	CSC	7	22.6	POT		BODY	PLAIN	SAND	
210	105	CSC	15	40.2	POT		BODY	CRMK	SAND	
210	110	CSC	1	0.1	CL	FLA	DECORT	CRT		
210	110	CSC	2	4.3	POT		DAUB			
210	110	CSC	1	0.5	POT		BODY	PLAIN	SHELL	
210	110	CSC	1	0.1	CL	FLA	CRT			
210	110	CSC	8	13.1	POT		BODY	PLAIN	SAND	
210	110	CSC	6	17.9	POT		BODY	CRMK	SAND	
210	110	CSC	1	1.9	POT		BODY	INCI	SHELL	
210	115	CSC	1	1.0	POT		BODY	PLAIN	SHELL	
210	115	CSC	5	9.9	POT		BODY	PLAIN	SAND	
215	95	CSC	1	0.8	CL	SHAT	CRT			
215	95	CSC	4	19.9	POT		DAUB			
215	95	CSC	4	2.3	POT		BODYFG	DEC	SAND	
215	95	CSC	1	10.4	CL	FLA	DECORT	CRT	FC	
215	95	CSC	3	3.9	CL	FLA	CRT			
215	95	CSC	1	0.6	CL	FLA	CRT	HT		
215	95	CSC	6	2.8	POT		BODYFG	PLAIN	SAND	
215	95	CSC	15	29.6	POT		BODY	CRMK	SAND	
215	95	CSC	2	3.6	POT		RIM	CRMK	SAND	
215	95	CSC	3	2.2	POT		BODY	PLAIN	SHELL	
215	95	CSC	3	2.9	POT		PEL			
215	95	CSC	13	24.3	POT		BODY	PLAIN	SAND	
215	95	CSC	4	8.2	POT		BODY	DEC	SAND	WEA
220	95	CSC	1	0.8	CL	FLA	DECORT	CRT		
220	95	CSC	2	19.6	URM	CHNK	SS			
220	95	CSC	3	45.2	URM	CHNK	CRT	FC		
220	95	CSC	2	1.6	CL	FLA	CRT			
220	95	CSC	2	0.5	CL	SHAT	RUM	CRT		
220	95	CSC	1	0.7	CL	SHAT	CRT			
220	95	CSC	1	0.6	URM	PEBL				
220	95	CSC	2	0.6	POT		BODYFG	DEC	SAND	

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT	#	CT	WT						
220	95	CSC		1	1.6	POT		RIM	CRMK	SAND	
220	95	CSC		16	40.2	POT		BODY	CRMK	SAND	
220	95	CSC		12	16.0	POT		BODY	PLAIN	SAND	
220	95	CSC		5	13.7	POT		DAUB			
220	95	CSC		1	0.7	POT		BODYFG	PLAIN	SHELL	
220	195	CSC		2	1.9	POT		PEL			
225	95	CSC			1.3	POT		BODYFG	PLAIN	SHELL	
225	95	CSC		2	3.7	CL	FLA	CRT			
225	95	CSC		3	3.4	CL	SHAT	CRT			
225	95	CSC		22	62.3	POT		BODY	CRMK	SAND	
225	95	CSC		31	62.3	POT		BODY	PLAIN	SAND	
225	95	CSC			4.6	POT		PEL			
230	95	CSC		3	6.8	POT		BODY	PLAIN	SAND	
230	95	CSC		4	11.0	POT		BODY	CRMK	SAND	
235	95	CSC			2.4	POT		PEL			
235	95	CSC		1	1.9	POT		BODYFG	PLAIN	SHELL	
235	95	CSC			8.9	POT		BODYFG	PLAIN	SAND	
235	95	CSC		11	27.0	POT		BODY	CRMK	SAND	
235	95	CSC		9	26.3	POT		BODY	PLAIN	SAND	
240	95	CSC		8	5.8	POT		BODY	DEC	SAND	WEA
240	95	CSC		19	20.6	POT		BODY	PLAIN	SAND	
240	95	CSC		1	0.5	POT		BODY	PLAIN	SHELL	
240	95	CSC		23	47.8	POT		BODY	CRMK	SAND	
240	95	CSC		2	1.6	POT		PEL			
240	95	CSC		5	10.5	POT		DAUB			
240	95	CSC		1	3.3	POT		RIM	CRMK	SAND	
		ST	1	1	2.9	POT		BODY	PLAIN	SAND	
		ST	1	1	0.6	POT		BODY	PLAIN	SHELL	
		ST	1	1	2.0	GLASS		CURVE	CLEAR		
		CSC		10	30.1	POT		BODY	PLAIN	SAND	
		CSC		37	128.6	POT		BODY	CRMK	SAND	
		CSC			63.2	POT		BODYFG	PLAIN	SAND	
		CSC		2	1.1	CL	FLA	CRT			
		CSC		2	30.6	URM		CRT	FC		
		CSC		1	1.0	POT		BODYFG	PLAIN	SHELL	
		CSC			19.3	POT		PEL			
		CSC			12.4	POT		BODYFG	CRMK	SAND	
		GENE		1	1.7	CL	FLA	DECORT	CRT	HT	
		GENE		10	14.0	CL	FLA	CRT			
		GENE		1	1.3	CL	FLA	NOV	HT		
		GENE		1	0.7	CL	FLA	DECORT	CRT		
		GENE		1	4.2	POT		BODY	PLAIN	SAND	
		GENE		1	155.7	URM	CHNK	CRT			
		GENE		1	1.7	CL	SHAT	CRT	HT		
		GENE		3	16.1	URM	CHNK	CRT	FC		
		GENE		5	41.2	CL	SHAT	CRT			
		GENE		1	8.7	STONE		ALBALB			
		GENE		1	16.5	STONE		ALBBRS			

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT #	CT	WT							
		GENE	1	44.4	EARTH		WHITE	BASE	TABLE	MOLD	GRAY
		GENE	1	3.1	EARTH		WHITE	BASE	UNDEC		
		GENE	4	7.6	EARTH		WHITE	UNDEC			
		GENE	1	26.3	EARTH		WHITE	BASE	MOLD		
		GENE	1	0.1	GLASS		MILK				
		GENE	1	56.5	GRL		GRIP	BAT	QZIT		
		GENE	1	91.7	CG		HOE	MILLCR			
		GENE	1	16.5	STONE		RIM	WHITE			
		GENE	1	18.5	STONE		BASE	ALBBRS			
		GENE	1	11.6	STONE		BRBUN				
		GENE	2	23.3	URM	PEBL					
		GENE	3	20.9	STONE		ALBBRS				
		GENE	1	12.1	STONE		ALBUN				
		GENE	1	4.7	STONE		BRBUN				
		GENE	4	13.1	EARTH		WHITE	UNDEC			
		GENE	2	28.1	EARTH		WHITE	RIM			
		GENE	1	11.2	EARTH		WHITE	BASE			
		GENE	2	17.4	FOSSI						
		GENE	2	7.9	POT		BODY	DEC	SAND	WEA	
		GENE	12	43.2	POT		BODY	CRMK	SAND		
		GENE	3	45.4	STONE		ALBALB				
		GENE	1	6.6	METAL		FERS	METOBJ			
		GENE	1	16.6	METAL		LEAD	METOBJ			
		GENE	9	45.2	GLASS		CURVE	LBRN			
		GENE	2	5.2	GLASS		CURVE	DBRN			
		GENE	3	8.4	GLASS		CURVE	CLEAR			
		GENE	2	2.6	POT		BODY	PLAIN	SHELL		
		GENE	6	18.4	POT		BODY	PLAIN	SAND		
		GENE	9	33.8	GLASS		CURVE	BOTTLE	LAV		
		GENE	1	1.9	EARTH		WHITE	DECAL			
		GENE	1	1.8	PORCE		TRANS				
		GENE	1	1.1	PORCE		MOLD				
		GENE	2	18.5	GLASS		BNECK	STOPPE	LAV		
		GENE	1	8.2	GLASS		MILK	PRESS			
		GENE	1	3.3	EARTH		WHITE	HPAINT	MARPAR		
		GENE	3	14.3	EARTH		WHITE	RIM	MOLD		
		GENE	2	14.2	CL		DECORT	CRT			
		GENE	1	277.8	GRL		HAM	QTZ			
		GENE	1	1.8	ANIM		BONE				
		GENE	1	16.1	CL	FLA	RUM	CRT			
		GENE	1	25.0	CL	CORE	SHAP	CRT			
		GENE	4	2.4	CL	FLA	CRT				
		GENE	1	13.3	EARTH		EARTH	BASE	WHITE		
		GENE	1	7.6	EARTH		STONEW	BODY	BRBBRS		
		GENE	1	8.6	EARTH		STONEW	BODY	ALBALB		
		GENE	4	7.5			FERS	METOBJ			
		GENE	3	15.8	EARTH		EARTH	WHITE	BODY		
		GENE	1	7.0	EARTH		EARTH	RIM	WHITE		

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT	#	CT	WT						
		GENE		38	133.3	POT		BODY	PLAIN	SAND	
		GENE			111.6	POT		BODYFG	PLAIN	SAND	
		GENE		26	77.8	POT		BODY	CRMK	SAND	
		GENE		1	0.5	URM		LIM			
		GENE		4	12.0	POT		DAUB			
		GENE		3	2.2	POT		PEL			
		GENE		6	17.1	POT		BODY	DEC	SAND	WEA
		GENE		1	9.8	POT		RIM	RED	SHELL	
		GENE		2	3.6	CL	SHAT	CRT			
		GENE		2	2.3	POT		BODY	PLAIN	SHELL	
		GENE		1	1.2	POT		BODY	INEN	SAND	
		GENE		1	3.5	POT		BODY	INCI	SHELL	
		GENE		1	3.3	GLASS		CURVE	MOLD	BLUE	
		GENE		2	9.3	GLASS		CURVE	MOLD	LAV	
		GENE		5	15.0	GLASS		CURVE	CLEAR		
		GENE		1	13.5	GLASS		LID	CLEAR		
		GENE		1	4.6	GLASS		CURVE	MOLD	BLUE	
		GENE		2	10.5	GLASS		CURVE	LGRN		
		GENE		1	5.5	GLASS		CURVE	LAV		
		GENE		1	6.5	GLASS		BASE	MOLD	MILK	MARPAR
		GENE		3	3.8	PORCE		UNDEC			
		GENE		1	1.7	EARTH		WHITE	DECAL		
		GENE		1	52.8	GLASS		BASE	MOLD	LAV	
		GENE		1	0.7	GLASS		MILK			
		GENE		1	1.5	EARTH		WHITE	RIM		
		GENE		1	1.2	GLASS		CURVE	LAV	MOLD	
		GENE		1	1.5	GLASS		FLAT	LBLUE		
		GENE		7	32.8	GLASS		CURVE	LBLUE		
		GENE		1	1.1	GLASS		CURVE	BROWN		
		GENE		5	7.1	GLASS		CURVE	CLEAR		
		GENE		4	30.1	GLASS		CURVE	LAV		
		GENE		18	42.6	POT		BODY	PLAIN	SAND	
		GENE		10	42.6	POT		BODY	CRMK	SAND	
		GENE		1	9.4	POT		RIM	CRMK	SAND	
		GENE		30	71.8	METAL		METOBJ			
		GENE		1	9.7	GLASS		CURVE	BLUE		
		1X1M		1	77.3	METAL		METOBJ	NUTBOL		
		1X1M	1		116.0	POT		DAUB			
		1X1M	1		22.9	POT		BODYFG	DEC	SAND	
		1X1M	1	1	0.1	ANIM		BONE			
		1X1M	1	1	3.0	URM	CHNK	CRT			
		1X1M	1		58.5	POT		BODYFG	PLAIN	SAND	
		1X1M	1	6	37.1	POT		BODY	DEC	SAND	WEA
		1X1M	1	2	17.0	POT		RIM	CRMK	SAND	
		1X1M	1	9	5.9	URM	PEBL				
		1X1M	1	23	85.7	POT		BODY	PLAIN	SAND	
		1X1M	1		17.5	POT		PEL			
		1X1M	1	1	10.0	POT		BODY	CRMK	SAND	

TABLE C-3
3MS471 ARTIFACTS

N	E	UNIT #	CT	WT						
		1X1M 1	3	3.4	POT		BODYFG	PLAIN	SAND	
		1X1M 1	1	9.6	POT		DAUB			
		1X1M 1	1	1.8	POT		BODYFG	PLAIN	SAND	
		1X1M 1	3	8.5	POT		BODY	CRMK	SAND	
		1X1M 1	12	8.0	POT		BODYFG	PLAIN	SAND	
		1X1M 1	12	48.0	POT		BODY	CRMK	SAND	
		1X1M 1	2	0.1	CL	FLA	CRT			
		1X1M 1		9.1	POT		PEL			
		1X1M 1	70	444.5	POT		BODY	CRMK	SAND	
		1X1M 1	7	3.8	POT		BODY	PLAIN	SHELL	
		1X1M 1	1	1.7	POT		RIM	DEC	SAND	WEA
		1X1M 1	1	2.6	URM	CHNK	CRT			
		1X1M 1	20	34.7	POT		BODY	PLAIN	SAND	
		1X1M 1	1	1.3	POT		RIM	PLAIN	SAND	
		1X1M 1	1	1.4	POT		BODY	POLIS	SHELL	
		1X1M 1		103.0	POT		BODYFG	PLAIN	SAND	
		1X1M 1		38.8	POT		BODYFG	DEC	SAND	
		1X1M 1		29.3	POT		PEL			
		1X1M 1	8	7.9	URM	PEBL				
		1X1M 1	10	2.3	URM	CONC	MANG			
		1X1M 1		58.0	POT		DAUB			
			1	2.3	POT		BODY	CRMK	SAND	
			1	2.4	EARTH		EARTH	WHITE	HANDLE	
			4	4.9	POT		BODY	PLAIN	SHELL	
			2	12.4	POT		BODY	FILM	RED	SHELL
			3	21.0	POT		BODY	CRMK	SAND	
			5	16.4	POT		BODY	DEC	SAND	WEA
			1	0.9	URM	CHNK	CRT	FC		
			1	1.9	URM					
			3	2.5	CL	FLA	CRT			
			19	35.0	POT		BODY	PLAIN	SAND	
			2	3.3	POT		PEL			
			3	24.6	CL	SHAT				

Number of artifacts in printout: 465
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 3:38

TABLE C-4 3MS471 ARTIFACTS FROM TEST UNIT BY DEPTH

MINARK D.B.S. V4.0

Database name: ARTFCRM
This retrieval performed: 22Sep86 0:2
Data last updated: 19Sep86 0:14
Total artifacts in database with data: 3614
# of artifacts excluded by security rating: 0

Subset name: 3MS471B # of artifacts in subset: 52

Cumulative selection criteria:
SNO = 3MS471 ;
UNIT = 1X1M ;

All artifacts selected

—) BDEPTH = 12

200	100	1X1M	1	0.00	12.00	1	2.6	POT		RIM	CRMK	SAND	

CT	1.00	1.000		1.00
WT	2.60	2.600		2.60

—) BDEPTH = 15

200	100	1X1M	1	0.00	15.00	2	0.2	ANIM		UNMOD	BONE		
200	100	1X1M	1	0.00	15.00	3	1.8	CL	FLA	CRT			
200	100	1X1M	1	0.00	15.00	1	0.3	GLASS		CURVE	CLEAR		
200	100	1X1M	1	0.00	15.00	1	1.6	CHIST		IND			
200	100	1X1M	1	0.00	15.00	26	65.7	POT		BODY	DEC	SAND	WEA
200	100	1X1M	1	0.00	15.00	21	61.2	POT		BODY	PLAIN	SAND	
200	100	1X1M	1	0.00	15.00		329.5	POT		BODYFG	PLAIN	SAND	
200	100	1X1M	1	0.00	15.00		49.6	POT		PEL			
200	100	1X1M	1	0.00	15.00	5	18.9	POT		DAUB			
200	100	1X1M	1	0.00	15.00	2	2.1	POT		BODY	PLAIN	SHELL	
200	100	1X1M	1	0.00	15.00	1	1.5	POT		RIM	PUNCT	SHELL	
200	100	1X1M	1	0.00	15.00	1	2.7	POT		DEB			
200	100	1X1M	1	0.00	15.00	48	136.6	POT		BODY	CRMK	SAND	
200	100	1X1M	1	0.00	15.00	1	0.7	POT		BODY	PLAIN	SAND	
100	200	1X1M	1	0.00	15.00		15.7	URM	CONC				

CT	112.00	9.333		113.00
WT	688.10	45.873		698.70

—) BDEPTH = 25

200	200	1X1M	1	15.00	25.00	2	0.4	ANIM		BONE
		1X1M	1	15.00	25.00		29.3	POT		PEL

TABLE C-4 3MS471 ARTIFACTS FROM TEST UNIT BY DEPTH

N	E	UNIT	#	TOP	BOTTM	CT	WT						
		1X1M	1	15.00	25.00	1	1.7	POT		RIM	DEC	SAND	WEA
		1X1M	1	15.00	25.00		38.8	POT		BODYFG	DEC	SAND	
		1X1M	1	15.00	25.00		58.0	POT		DAUB			
		1X1M	1	15.00	25.00		103.0	POT		BODYFG	PLAIN	SAND	
		1X1M	1	15.00	25.00	7	3.8	POT		BODY	PLAIN	SHELL	
200	100	1X1M	1	15.00	25.00	21	59.5	POT		BODY	DEC	SAND	WEA
200	100	1X1M	1	15.00	25.00	52	185.1	POT		BODY	CRMK	SAND	
		1X1M	1	15.00	25.00	20	34.7	POT		BODY	PLAIN	SAND	
		1X1M	1	15.00	25.00	1	1.4	POT		BODY	POLIS	SHELL	
		1X1M	1	15.00	25.00	1	1.3	POT		RIM	PLAIN	SAND	
		1X1M	1	15.00	25.00	1	2.6	URM	CHNK	CRT			
		1X1M	1	15.00	25.00	8	7.9	URM	PEBL				
		1X1M	1	15.00	25.00	10	2.3	URM	CONC	MANG			

CT	124.00	11.273	237.00
WT	529.80	35.320	1220.50

—) BDEPTH = 40

1X1M	1	20.00	40.00	1	9.6	POT	DAUB		
1X1M	1	20.00	40.00	1	1.8	POT	BODYFG	PLAIN	SAND
1X1M	1	20.00	40.00	1	10.0	POT	BODY	CRMK	SAND

CT	3.00	1.000	240.00
WT	21.40	7.133	1241.90

—) BDEPTH = 35

1X1M	1	25.00	35.00	1	0.1	ANIM		BONE			
1X1M	1	25.00	35.00	2	17.0	POT		RIM	CRMK	SAND	
1X1M	1	25.00	35.00	70	444.5	POT		BODY	CRMK	SAND	
1X1M	1	25.00	35.00		17.5	POT		PEL			
1X1M	1	25.00	35.00		116.0	POT		DAUB			
1X1M	1	25.00	35.00	6	37.1	POT		BODY	DEC	SAND	WEA
1X1M	1	25.00	35.00	23	65.7	POT		BODY	PLAIN	SAND	
1X1M	1	25.00	35.00		22.9	POT		BODYFG	DEC	SAND	
1X1M	1	25.00	35.00		58.5	POT		BODYFG	PLAIN	SAND	
1X1M	1	25.00	35.00	1	3.0	URM	CHNK	CRT			
1X1M	1	25.00	35.00	9	5.9	URM	PEBL				

CT	112.00	16.000	352.00
WT	808.20	73.473	2050.10

—) BDEPTH = 45

1X1M	1	35.00	45.00	2	0.1	CL	FLA	CRT		
1X1M	1	35.00	45.00	12	48.0	POT		BODY	CRMK	SAND
1X1M	1	35.00	45.00	12	8.0	POT		BODYFG	PLAIN	SAND
1X1M	1	35.00	45.00		9.1	POT		PEL		
1X1M	1	45.00	45.00	3	8.5	POT		BODY	CRMK	SAND

TABLE C-4 3MSA71 ARTIFACTS FROM TEST UNIT BY DEPTH

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__\___E__UNIT_#__TOP___BOTTM___CT____WT_____________________________
    CT            29.00      7.250          381.20
    WT            73.70     14.740         2123.80


—) BDEPTH = 55

       1X1M 1 45.00  55.00   3    3.4   POT          BODYFG PLAIN SAND

    CT             3.00      3.000          384.00
    WT             3.40      3.400         2127.20


—) BDEPTH = 0

       1X1M   0.00   0.00    1     77.3  METAL        METOBJ NUTBOL

    CT             1.00      1.000          385.00
    WT            77.30     77.300         2204.50


   BDEPTH = 0


Number of artifacts in printout:              52
# of artifacts excluded by security rating:    0

Output completed: 22Sep86  0:2
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TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT					
0	0	GENE	1	2.2	POT		BODY	DEC	SAND WEA
0	0	GENE	1	0.1	CL	FLA	DECORT	CRT	
0	0	GENE	1	1.8	POT		BODY	PLAIN SHELL	
0	60	CSC	1	2.1	GLASS		CURVE	COBALT	
0	60	CSC	1	6.1	GLASS		CLEAR	MELT	
0	60	CSC	1	25.4	METAL		FERS	METOBJ	
0	60	CSC	3	178.4	BRICK				
0	60	CSC	1	1.0	GLASS		SQUARE	CLEAR	
0	60	CSC	2	3.6	GLASS		FLAT	CLEAR	
0	60	CSC	1	0.8	GLASS		CURVE	LGRN	
0	65	CSC	1	2.4	GLASS		CURVE	LAV	
0	65	CSC	1	9.1	GLASS		JAR	MILK	
0	65	CSC	1	1.6	GLASS		MLID	MILK	
0	65	CSC	2	1.8	EARTH		WHITE	RIM	
0	65	CSC	3	3.4	EARTH		WHITE		
0	65	CSC	1	23.7	GLASS		JBASE	CLEAR	MARPAR
0	65	CSC	1	0.6	GLASS		CURVE	CLEAR	MOLD
0	65	CSC	2	1.2	GLASS		CURVE	CLEAR	
0	65	CSC	1	0.7	GLASS		FLAT	CLEAR	
0	65	CSC	2	137.1	BRICK				
0	65	CSC	1	4.9	GLASS		BROWN	MELT	
0	65	CSC	1	5.1	GLASS		CURVE	LGRN	
0	65	CSC	2	1.2	GLASS		FLAT	LGRN	
0	65	CSC	1	4.6	GLASS		CURVE	BROWN	
0	65	CSC	1	5.1	EARTH		WHITE	BASE	
0	65	CSC	2	7.8	URM		OZIT		
0	65	CSC	1	3.2	PORCE		DECAL		
0	65	CSC	1	1.3	PORCE		DEC		
0	70	CSC	1	0.8	GLASS		CURVE	LBLUE	
0	70	CSC	1	2.4	GLASS		CURVE	DBRN	
0	70	CSC	5	3.8	GLASS		CURVE	CLEAR	
0	70	CSC	1	2.4	GLASS		CURVE	LGRN	
0	70	CSC	1	5.6	GLASS		CLEAR	MELT	
0	70	CSC	1	0.6	POT		BODY	PLAIN SAND	
0	70	CSC	1	0.6	SHELL				
0	70	CSC	1	1.5	STONE		GLAZE		
0	70	CSC	3	1.7	METAL		FERS	METOBJ	
0	70	CSC	2	9.0	EARTH		WHITE	BASE	
0	70	CSC	1	1.4	EARTH		WHITE	RIM	
0	70	CSC	6	97.3	BRICK				
0	70	CSC	3	3.9	GLASS		MLID	MILK	
0	70	CSC	5	5.7	EARTH		WHITE		
0	70	CSC	1	6.2	GLASS		BASE	LAV	EMBOSS
0	70	CSC	1	5.3	GLASS		CURVE	LAV	PRESS
0	70	CSC	2	3.6	GLASS		SQUARE	CLEAR	
0	70	CSC	3	2.2	GLASS		FLAT	CLEAR	
0	75	CSC	3	7.3	GLASS		CURVE	CLEAR	
0	75	CSC	1	3.8	GLASS		CURVE	LAV	

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT						
0	75	CSC	2	2.0	GLASS		FLAT	CLEAR		
0	75	CSC	5	123.2	BRICK					
0	75	CSC	6	5.9	METAL		FERS			
0	75	CSC	1	0.5	GLASS		CURVE	CLEAR	MOLD	
0	75	CSC	1	0.1	URM	CHNK	SS			
0	75	CSC	1	0.1	URM	PEBL				
0	75	CSC	1	1.6	GLASS		BASE	BROWN	EMBOSS	
0	75	CSC	1	15.1	GLASS		JRIM	CLEAR	SLIP	THREAD
0	90	CSC	1	1.4	POT		BODY	PLAIN SAND		
0	95	CSC	1	1.8	POT		BODY	PLAIN SAND		
5	60	CSC	1	0.8	GLASS		CURVE	LBLUE		
5	60	CSC	1	4.1	GLASS		MILK	MELT		
5	60	CSC	3	0.3	GLASS		CURVE	CLEAR		
5	60	CSC	1	3.6	GLASS		CURVE	CLEAR	EMBOSS	
5	60	CSC	1	1.8	EARTH		WHITE	BASE		
5	60	CSC	1	0.2	URM		CANC			
5	60	CSC	1	2.6	BRICK					
5	60	CSC	1	4.8	PORCE		RIM	MOLD		
5	65	CSC	1	2.1	EARTH		WHITE			
5	65	CSC	1	1.9	EARTH		WHITE	RIM		
5	65	CSC	1	1.8	EARTH		WHITE	MONOG	BLUE	
5	65	CSC	1	26.2	URM	CHNK	HEM			
5	65	CSC	1	4.8	STONE		SALSAL			
5	65	CSC	1	6.8	GLASS		JLID	CLEAR	MOLD	
5	65	CSC	4	74.4	BRICK					
5	65	CSC	2	7.4	GLASS		CURVE	LAV		
5	65	CSC	1	1.2	GLASS		MLID	MILK		
5	65	CSC	1	0.4	GLASS		CURVE	CLEAR		
5	70	CSC	1	1.4	EARTH		WHITE			
5	70	CSC	1	11.3	EARTH		WHITE	BASE		
5	70	CSC	2	359.9	BRICK					
5	70	CSC	1	3.1	GLASS		CURVE	LAV		
5	70	CSC	1	1.2	GLASS		CURVE	CLEAR	MOLD	
5	70	CSC	3	4.5	GLASS		FLAT	CLEAR		
5	70	CSC	1	6.1	GLASS		BBASE	CLEAR	MARCOM	
5	70	CSC	1	2.7	URM	PEBL				
5	70	CSC	2	0.5	GLASS		MELT			
5	70	CSC	1	0.7	SYN		RUBBER			
5	70	CSC	2	12.7	STONE		ALBBRS			
5	70	CSC	1	3.9	SHELL					
5	70	CSC	1	1.4	EARTH		WHITE	RIM	MOLD	
5	70	CSC	1	34.4	METAL		FERS	CRSCNT		
5	70	CSC	1	3.9	GLASS		CURVE	CLEAR	PRESS	
5	70	CSC	1	50.8	GLASS		BOTTLE	SLIP	PINK	
5	70	CSC	1	45.4	METAL		FERS	METOBJ		
5	75	CSC	1	3.6	GLASS		CURVE	LBLUE		
5	75	CSC	2	2.9	GLASS		FLAT	CLEAR		
5	75	CSC	1	1.4	GLASS		CURVE	CLEAR	MOLD	

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT					
5	75	CSC	1	2.0	GLASS		CURVE	DBRN	
5	75	CSC	3	6.5	GLASS		CURVE	CLEAR	
5	75	CSC	1	2.3	EARTH		WHITE	RIM	
5	75	CSC	2	39.8	BRICK				
5	75	CSC	1	6.8	GLASS		CURVE	LAV	
5	75	CSC	1	1.4	EARTH		WHITE		
5	75	CSC	1	2.5	GLASS		CLEAR	MELT	
5	75	CSC	1	25.3	GLASS		BASE	DBRN	RSB
5	75	CSC	2	0.6	GLASS		CLEAR		
5	75	CSC	1	1.2	EARTH		WHITE	UNDEC	
5	75	CSC	1	60.3	METAL		FERS	METOBJ	
5	80	CSC	1	1.1	GLASS		CURVE	CLEAR	
5	80	CSC	1	3.4	POT		RIM	PLAIN SAND	
5	85	CSC	1	0.2	GLASS		CURVE	CLEAR	
5	95	CSC	1	1.6	POT		BODY	PLAIN SAND	
15	90	CSC	1	0.3	METAL		BUTTON		
20	90	CSC	1	1.6	POT		BODY	PLAIN SAND	
20	95	CSC	3	8.2	POT		BODY	PLAIN SAND	
20	95	CSC	1	1.0	POT		PEL		
25	90	CSC	2	1.5	POT		BODY	PLAIN SAND	
25	90	CSC	2	1.4	POT		PEL		
25	90	CSC	1	0.9	METAL		FERS	METOBJ	
25	95	CSC	2	3.6	POT		BODY	PLAIN SAND	
30	90	CSC	4	7.7	POT		BODY	PLAIN SAND	
30	95	CSC	3	4.7	POT		BODY	PLAIN SAND	
30	95	CSC	1	2.0	GLASS		CURVE	LGRN	
35	90	CSC	4	5.7	POT		BODY	PLAIN SAND	
35	90	CSC	1	1.7	POT		DAUB		
35	90	CSC	1	0.8	POT		BODY	PLAIN SHELL	
35	90	CSC	1	2.0	POT		BODY	CRMK SAND	
35	95	CSC	8	17.4	POT		BODY	PLAIN SAND	
40	60	CSC	1	3.0	STONE		ALBOTH		
40	60	CSC	1	8.8	BRICK				
40	65	CSC	1	4.4	GLASS		BNECK	BROWN	MOLD
40	65	CSC	1	0.2	URM		CANC		
40	70	CSC	1	16.4	GLASS		BNECK	LAV	
40	70	CSC	2	0.7	METAL		FERS		
40	75	CSC	1	0.3	URM	CHNK	CANC		
40	75	CSC	2	2.0	POT		BODY	PLAIN SAND	
40	85	CSC	2	4.4	POT		BODY	PLAIN SAND	
40	85	CSC	1	12.3	METAL		FERS		
40	90	CSC	1	0.2	URM	CHNK	SS		
40	90	CSC	14	25.6	POT		BODY	PLAIN SAND	
40	90	CSC	1	0.5	POT		DAUB		
40	90	CSC	1	1.9	POT		BODY	CRMK SAND	
45	90	CSC	2	15.9	URM	PEBL			
45	90	CSC	6	7.1	POT		PEL		
45	90	CSC	1	2.0	POT		BODY	PLAIN SAND	

TABLE C-5
3MS119 ARTIFACTS

N	S	UNIT #	CT	WT						
45	90	CSC	1	4.8	METAL		FERS			
45	90	CSC	1	8.5	POT		BASE	CRMK	SAND	
45	90	CSC	2	6.8	POT		BODY	DEC	SAND	WEA
45	90	CSC	5	6.1	POT		BODY	CRMK	SAND	
45	90	CSC	20	27.5	POT		BODY	PLAIN	SAND	
45	95	CSC	1	0.5	POT		BODY	PLAIN	SHELL	
45	95	CSC	1	9.0	POT		DAUB			
45	95	CSC	1	9.6	POT		BODY	CRMK	SAND	
45	95	CSC	11	22.7	POT		BODY	PLAIN	SAND	
50	90	CSC	16	35.5	POT		BODY	PLAIN	SAND	
50	90	CSC	3	2.7	POT		DAUB			
50	90	CSC	3	6.8	POT		BODY	CRMK	SAND	
50	95	CSC	3	1.7	POT		PEL			
50	95	CSC	14	33.4	POT		BODY	PLAIN	SAND	
50	95	CSC	1	3.5	POT		BODY	CRMK	SAND	
55	90	CSC	1	2.1	EARTH		WHITE	MARPAR		
55	90	CSC	1	2.3	CL	SHAT	POLISH	CRT		
55	90	CSC	8	10.7	POT		BODY	PLAIN	SAND	
55	90	CSC	1	0.7	SYN		PLAST	BCAP		
55	95	CSC	7	8.5	POT		BODY	PLAIN	SAND	
55	95	CSC	2	1.5	POT		PEL			
60	90	CSC	1	9.6	URM	CHNK	CRT			
60	90	CSC	11	15.1	POT		BODY	PLAIN	SAND	
60	95	CSC	4	5.5	POT		BODY	PLAIN	SAND	
60	95	CSC	2	21.0	URM	CHNK	CRT			
65	90	CSC	1	2.6	POT		BODY	DEC	SAND	WEA
65	90	CSC	1	3.7	POT		BODY	CRMK	SAND	
65	90	CSC	1	0.8	POT		BODY	PLAIN	SHELL	
65	90	CSC	13	21.4	POT		BODY	PLAIN	SAND	
65	90	CSC	1	3.9	POT		BODY	CRMK	SAND	
65	90	CSC	2	3.4	POT		DAUB			
65	95	CSC	1	0.3	URM	CHNK	CRT			
65	95	CSC	9	14.4	POT		BODY	PLAIN	SAND	
65	95	CSC	1	0.2	URM	CHNK	LS			
65	95	CSC	1	1.9	POT		PEL			
65	95	CSC	1	4.5	POT		BODY	CRMK	SAND	
70	90	CSC	1	1.7	POT		BODY	CRMK	SAND	
70	90	CSC	1	1.1	POT		BODY	PLAIN	SHELL	
70	90	CSC	8	21.1	POT		BODY	PLAIN	SAND	
70	95	CSC	2	0.5	POT		PEL			
70	95	CSC	9	21.5	POT		BODY	PLAIN	SAND	
75	90	CSC	9	11.7	POT		BODY	PLAIN	SAND	
75	90	CSC	1	2.4	POT		PEL			
75	95	CSC	2	4.8	POT		BODY	CRMK	SAND	
75	95	CSC	1	4.6	POT		PEL			
75	95	CSC	1	11.0	BRICK					
80	60	CSC	4	4.9	POT		DAUB			
80	60	CSC	5	5.2	GLASS		CURVE	BROWN		

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT						
80	60	CSC	11	13.3	POT		BODY	PLAIN	SAND	
80	60	CSC	1	4.0	POT		BODY	CRMK	SAND	
80	60	CSC	1	4.0	POT		BODY	DEC	SAND	WEA
80	60	CSC	1	1.3	URM	PEBL	QTZ			
80	60	CSC	1	5.9	URM	PEBL	QZIT			
80	60	CSC	9	2.3	METAL		FERS	METOBJ		
80	60	CSC	1	1.4	GLASS		CURVE	LAV		
80	60	CSC	1	0.5	GLASS		CURVE	LBLUE		
80	60	CSC	1	0.8	POT		BODY	PLAIN	SHELL	
80	65	CSC	2	2.7	POT		BODY	DEC	SAND	WEA
80	65	CSC	10	14.2	POT		BODY	PLAIN	SAND	
80	65	CSC	1	0.2	URM	CHNK	QZIT			
80	65	CSC	1	1.0	POT		PEL			
80	70	CSC	11	15.1	POT		BODY	PLAIN	SAND	
80	70	CSC	1	1.0	ANIM					
80	80	CSC	4	4.3	POT		BODYFG	PLAIN	SAND	
80	80	CSC	3	12.8	POT		BODY	PLAIN	SAND	
80	80	CSC	1	13.3	METAL		FERS			
80	85	CSC	5	7.9	POT		BODY	PLAIN	SAND	
80	90	CSC	8	8.6	POT		BODY	PLAIN	SAND	
80	90	CSC	1	4.2	EARTH		WHITE	BODY		
80	90	CSC	3	15.1	BRICK					
80	90	CSC	2	6.5	POT		BODY	DEC	SAND	WEA
80	95	CSC	1	1.4	POT		BODY	DEC	SAND	WEA
80	95	CSC	12	20.3	POT		BODY	PLAIN	SAND	
80	95	CSC	1	0.9	POT		PEL			
85	90	CSC	1	5.5	BRICK					
85	90	CSC	1	73.3	METAL		FERS	METOBJ		
85	90	CSC	8	19.4	POT		BODY	PLAIN	SAND	
85	95	CSC	2	6.3	POT		BODY	PLAIN	SAND	
85	95	CSC	2	1.0	POT		PEL			
90	90	CSC	11	17.6	POT		BODY	PLAIN	SAND	
90	95	CSC	1	10.2	EARTH		REDWAR	MONOG	BROWN	
90	95	CSC	1	1.5	BRICK					
90	95	CSC	9	11.8	POT		BODY	PLAIN	SAND	
90	95	CSC	1	3.5	CL	FLA	CRT			
95	90	CSC	14	20.3	POT		BODY	PLAIN	SAND	
95	95	CSC	12	33.2	POT		BODY	PLAIN	SAND	
95	95	CSC	1	3.5	POT		BODY	CRMK	SAND	
95	95	CSC	1	0.7	POT		PEL			
100	90	CSC	1	0.1	STONE		ALBOTH			
100	90	CSC	32	57.9	POT		BODY	PLAIN	SAND	
100	90	CSC	2	10.3	POT		PEL			
100	90	CSC	1	4.8	URM	CHNK	CRT			
100	95	CSC	1	14.5	POT		BODY	DEC	SAND	WEA
100	95	CSC	3	3.3	POT		BODY	PLAIN	SAND	
100	95	CSC	1	1.1	EARTH		REDWAR	MONOG	BROWN	
105	90	CSC	1	1.1	EARTH		WHITE	RIM		

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT	#	CT	WT						
105	90	CSC		1	19.9	STONE		NECK	JUG	ALBALB	
105	90	CSC		1	1.0	GLASS		CURVE	CLEAR		
105	90	CSC		1	0.3	METAL		FERS	METOBJ		
105	90	CSC		1	1.9	POT		BODY	CRMK	SAND	
105	90	CSC		18	26.6	POT		BODY	PLAIN	SAND	
105	90	CSC		2	2.3	POT		PEL			
105	90	CSC		2	6.6	URM	PEBL	CRT			
105	90		5	1	2.5	METAL		FERS	NAIL		
105	95	CSC		1	2.8	POT		BODY	DEC	SAND	WEA
105	95	CSC		3	2.2	POT		PEL			
105	95	CSC		4	6.0	POT		BODY	CRMK	SAND	
105	95	CSC		18	20.0	POT		BODY	PLAIN	SAND	
110	90	CSC		1	0.8	POT		PEL			
110	90	CSC		17	18.5	POT		BODY	PLAIN	SAND	
110	90	CSC		1	0.6	POT		MDLOBJ			
110	90	CSC		1	12.9	STONE		BODY	ALBALB		
110	95	CSC		1	5.4	STONE		ALBALB			
110	95	CSC		1	2.0	POT		BODY	CRMK	SAND	
110	95	CSC		1	3.2	POT		BODY	PLAIN	SAND	
115	90	CSC		1	1.7	GLASS		CURVE	LGRN		
115	90	CSC		2	17.8	METAL		FERS	METOBJ		
115	90	CSC		2	37.9	URM	CHNK	CRT			
115	90	CSC		1	2.2	STONE		BODY	ALBALB		
115	90	CSC		10	25.8	POT		PEL			
115	90	CSC		44	68.7	POT		BODY	PLAIN	SAND	
115	90	CSC		3	10.1	POT		BODY	CRMK	SAND	
115	95	CSC		2	6.7	POT		BODY	CRMK	SAND	
120	60	CSC		4	4.6	POT		BODY	SAND		
120	60	CSC		1	0.2	CL	FLA	SPOKS	RUM	CRT	
120	70	CSC		1	6.6	GLASS		CLEAR	MELT		
120	70	CSC		8	11.0	POT		BODY	PLAIN	SAND	
120	75	CSC		5	11.0	POT		BODY	PLAIN	SAND	
120	75	CSC		6	5.5	METAL		FERS			
120	80	CSC		2	2.0	POT		BODYFG	CRMK	SAND	
120	80	CSC		4	3.0	POT		BODYFG	PLAIN	SAND	
120	80	CSC			2.7	POT		PEL			
120	85	CSC		3	8.1	POT		BODY	CRMK	SAND	
120	85	CSC		4	10.2	POT		BODY	PLAIN	SAND	
120	90	CSC		2	5.3	POT		BODY	CRMK	SAND	
120	90	CSC		3	5.8	POT		PEL			
120	90	CSC		11	11.8	POT		BODY	PLAIN	SAND	
120	90	CSC		1	0.2	URM	PEBL	CRT			
120	90	CSC		1	4.8	STONE		BODY	ALBSAL		
120	90	CSC		1	0.8	METAL		METOBJ			
120	95	CSC		2	4.2	POT		BODY	CRMK	SAND	
120	95	CSC		2	1.2	POT		DAUB			
120	95	CSC		1	0.1	POT		PEL			
120	95	CSC		2	29.9	STONE		ALBALB			

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT						
120	95	CSC	4	6.6	POT		BODY	PLAIN	SAND	
120	95	CSC	1	14.5	STONE		REDWAR	MONOG	BROWN	
120	95	CSC	3	7.8	POT		BODY	DEC	SAND	WEA
125	90	CSC	1	7.3	URM	CHNK	CRT			
125	90	CSC	1	32.2	STONE		BODY	ALBALB		
125	90	CSC	9	18.2	POT		BODY	PLAIN	SAND	
125	90	CSC	1	3.0	GLASS		CURVE	CLEAR		
125	90	CSC	1	1.9	EARTH		RIM	WHITE		
125	90	CSC	2	6.3	POT		BODY	CRMK	SAND	
125	95	CSC	2	3.5	POT		DAUB			
125	95	CSC	1	1.3	URM	PEBL	QTZ			
125	95	CSC	4	2.9	POT		BODY	PLAIN	SAND	
125	95	CSC	5	8.3	POT		BODY	CRMK	SAND	
125	95	CSC	1	1.9	POT		BODY	DEC	SAND	WEA
130	90	CSC	1	39.7	URM	CHNK	CRT			
130	90	CSC	5	2.8	POT		PEL			
130	90	CSC	8	19.2	POT		BODY	PLAIN	SAND	
130	50	CSC	1	1.6	GL	SHAT	CRT	HT		
130	90	CSC	1	0.5	GLASS		MOLD	CLEAR		
130	90	CSC	2	8.8	GLASS		CURVE	LAV		
130	95	CSC	2	3.2	POT		BODY	PLAIN	SAND	
130	95	CSC	2	13.0	POT		DAUB			
130	95	CSC	1	12.5	POT		RIM	CRMK	SAND	
130	95	CSC	2	11.3	POT		BODY	CRMK	SAND	
130	95	CSC	1	5.7	EARTH		WHITE	RIM		
135	90	CSC	2	0.1	FOSSI		IND			
135	90	CSC	2	7.8	POT		BODY	CRMK	SAND	
135	90	CSC	2	6.9	EARTH		RIM	WHITE		
135	90	CSC	10	11.0	POT		BODY	PLAIN	SAND	
135	90	CSC	2	3.1	POT		PEL			
135	95	CSC	13	18.3	POT		BODY	PLAIN	SAND	
135	95	CSC	7	23.2	POT		BODY	CRMK	SAND	
135	95	CSC	2	2.4	POT		BODY	PLAIN	SHELL	
135	95	CSC	1	0.2	POT		PEL			
135	95	CSC	2	33.0	POT		DAUB			
140	90	CSC	11	31.3	POT		BODY	CRMK	SAND	
140	90	CSC	7	11.2	POT		BODY	DEC	SAND	WEA
140	90	CSC	1	5.3	URM	PEBL				
140	90	CSC	1	0.7	GL	FLA	DECORT	CRT		
140	90	CSC	1	0.9	POT		PEL			
140	90	CSC	3	2.1	POT		DAUB			
140	90	CSC	1	0.5	POT		BODY	PLAIN	SHELL	
140	95	CSC	6	5.7	POT		DAUB			
140	95	CSC	1	1.1	POT		PEL			
140	95	CSC	1	4.5	URM	PEBL				
140	95	CSC	1	0.8	POT		RIM	DEC	SAND	WEA
140	95	CSC	2	4.6	POT		BODY	DEC	SAND	WEA
140	95	CSC	3	3.6	POT		BODY	PLAIN	SHELL	

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT						
140	95	CSC	1	4.6	GLASS		CURVE	CLEAR		
140	95	CSC	1	28.2	STONE		BASE	ALBALB		
140	95	CSC	9	29.1	POT		BODY	CRMK	SAND	
140	95	CSC	5	8.5	POT		BODY	PLAIN	SAND	
144	94	1X1M 1	1	2.0	POT		BODY	RED	SHELL	
145	90	CSC	1	6.0	URM	CHNK	CRT			
145	90	CSC	1	0.6	EARTH		BODY	MONOG		
145	90	CSC	1	2.7	EARTH		REDWAR	BODY	GREEN	
145	90	CSC	15	29.1	POT		BODY	PLAIN	SAND	
145	90	CSC	2	18.4	POT		PEL			
145	95	CSC	4	11.5	POT		BODY	CRMK	SAND	
145	95	CSC	3	2.8	POT		BODY	PLAIN	SAND	
145	95	CSC	2	2.2	POT		DAUB			
150	90	CSC	2	0.8	GLASS		CURVE	LAV		
150	90	CSC	1	25.5	CL	BIFK	CRT	FC		
150	90	CSC	1	1.4	METAL		METOBJ			
150	90	CSC	1	0.5	GLASS		CURVE	CLEAR		
150	90	CSC	46	75.8	POT		BODY	PLAIN	SAND	
150	90	CSC	6	16.4	POT		BODY	CRMK	SAND	
150	90	CSC	3	8.5	POT		BODY	RED	SAND	
150	90	CSC	10	17.1	POT		PEL			
150	95	CSC	3	5.4	POT		BODY	PLAIN	SHELL	
150	95	CSC	10	2.1	METAL		FERS			
150	95	CSC	1	0.7	GLASS		CURVE	BROWN		
150	95	CSC	1	2.1	POT		RIM	PLAIN	SAND	
150	95	CSC	20	46.9	POT		BODY	CRMK	SAND	
150	95	CSC	20	38.9	POT		BODY	PLAIN	SAND	
150	95	CSC	2	3.5	POT		BODY	DEC	SAND	WEA
150	95	CSC		4.9	POT		BODYFG	PLAIN	SAND	
150	95	CSC	1	2.0	POT		PEL			
150	95	CSC	1	0.4	URM	PEBL				
150	95	CSC	12	6.9	POT		DAUB			
150	95	CSC		1.5	POT		BODYFG	DEC	SAND	
150	95	CSC	1	0.2	URM	CHNK	FC			
155	90	CSC	4	5.3	POT		PEL			
155	90	CSC	1	1.0	POT		BODY	PLAIN	SHELL	
155	90	CSC	1	0.3	URM		CANC			
155	90	CSC	1	4.7	URM	CHNK	CRT			
[illegible]	90	CSC	1	4.2	POT		BODY	PLAIN	SHELSA	
155	90	CSC	1	1.9	URM		SS			
155	90	CSC	1	8.5	GLASS		CURVE	CLEAR		
155	90	CSC	21	33.3	POT		BODY	PLAIN	SAND	
155	90	CSC	4	6.8	POT		BODY	CRMK	SAND	
155	95	CSC	1	0.3	METAL		FERS			
155	95	CSC	7	6.3	POT		DAUB			
155	95	CSC	1	0.8	GLASS		SQUARE	LAV	MOLD	
155	95	CSC	7	18.4	POT		BODY	DEC	SAND	WEA
155	95	CSC	12	26.2	POT		BODY	CRMK	SAND	

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT						
155	95	CSC	4	3.2	POT		BODY	PLAIN	SHELL	
155	95	CSC	15	14.7	POT		BODY	PLAIN	SAND	
155	95	CSC	1	1.8	URM	CHNK				
160	60	CSC	1	1.3	POT		PEL			
160	60	CSC	1	5.8	URM	CHNK	QZIT			
160	60	CSC	2	0.8	METAL		FERS	METOBJ		
160	60	CSC	2	5.0	POT		BODY	DEC	SAND	WEA
160	60	CSC	16	33.5	POT		BODY	PLAIN	SAND	
160	60	CSC	2	4.8	POT		BODY	CRMK	SAND	
160	60	CSC	1	2.4	POT		RIM	CRMK	SAND	
160	65	CSC	1	1.4	POT		PEL			
160	65	CSC	1	2.2	GLASS		NECK	CLEAR	THREAD	
160	65	CSC		0.1	URM	CHNK	SS			
160	65	CSC	1	4.0	POT		BODY	DEC	SAND	WEA
160	65	CSC	5	16.8	POT		BODY	CRMK	SAND	
160	65	CSC	10	14.4	POT		BODY	PLAIN	SAND	
160	70	CSC	1	15.0	URM		SS			
160	70	CSC	1	7.5	URM		CRT	FC		
160	70	CSC	1	0.2	GLASS		FLAT	CLEAR		
160	70	CSC	1	1.0	POT		DEB			
160	70	CSC	18	32.5	POT		BODY	PLAIN	SAND	
160	70	CSC	5	9.0	POT		BODY	CRMK	SAND	
160	75	CSC	1	3.9	POT		BODY	PLAIN	SHELL	
160	75	CSC	1	1.6	POT		BODY	PLAIN	SAND	
160	75	CSC	1	3.8	POT		BODY	CRMK	SAND	
160	75	CSC	1	1.0	GLASS		BROWN			
160	75	CSC	1	6.8	GLASS		CURVE	LAV		
160	75	CSC	1	0.8	URM	CHNK	CANC			
160	80	CSC	1	12.0	EARTH		WHITE	RIM	UNDEC	
160	80	CSC		28.6	POT		BODYFG	PLAIN	SAND	
160	80	CSC	1	2.8	GLASS		CURVE	LAV		
160	80	CSC		5.7	POT		PEL			
160	80	CSC	4	9.2	POT		BODY	CRMK	SAND	
160	80	CSC	5	19.0	POT		BODY	PLAIN	SAND	
160	80	CSC	2	3.1	POT		BODY	PLAIN	SHELL	
160	85	CSC	1	1.1	POT		BODY	PLAIN	SHELL	
160	85	CSC	1	1.9	POT		RIMFG	PLAIN	SAND	
160	85	CSC	7	27.3	POT		BODY	CRMK	SAND	
160	85	CSC	6	24.8	POT		BODY	PLAIN	SAND	
160	85	CSC	17	27.6	POT		BODYFG	PLAIN	SAND	
160	85	CSC	10	39.5	POT		PEL			
160	85	CSC	1	16.9	STONE		BODY	BRSBRS		
160	85	CSC	1	65.8	STONE		RIM	BRSBRS		
160	90	CSC	3	15.9	POT		PEL			
160	90	CSC	1	9.6	STONE		ALBALB			
160	90	CSC	1	0.8	CL	FLA	DECORT	CRT		
160	90	CSC	1	3.5	POT		RIM	CRMK	SAND	
160	90	CSC	3	7.0	POT		BODY	CRMK	SAND	

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT						
160	90	CSC	20	31.6	POT		BODY	PLAIN	SAND	
165	90	CSC	1	3.4	POT		RIM	CRMK	GROG	
165	90	CSC	1	4.1	GLASS		CURVE	LAV	EMBOSS	
165	90	CSC	1	6.3	GLASS		SQUARE	LAV		
165	90	CSC	10	12.0	POT		BODY	PLAIN	SAND	
165	90	CSC	2	2.9	POT		DAUB			
165	90	CSC	1	2.1	POT		PEL			
165	90	CSC	2	2.6	POT		BODY	CRMK	SAND	
165	95	CSC	3	6.5	POT		BODY	DEC	SAND	WEA
165	95	CSC	7	29.9	POT		BODY	CRMK	SAND	
165	95	CSC	1	2.6	POT		BODY	RED	SHELL	
165	95	CSC	4	8.4	POT		BODY	PLAIN	SAND	
165	95	CSC	1	6.2	STONE		ALBALB			
165	95	CSC	5	7.1	POT		PEL			
165	95	CSC	2	8.4	POT		DAUB			
170	90	CSC	1	1.4	EARTH		WHITE	BODY		
170	90	CSC	1	0.3	URM	CHNK	QZIT			
170	90	CSC	1	0.1	GLASS		YELLOW			
170	90	CSC	2	0.8	URM	CHNK	CRT			
170	90	CSC	1	2.1	GLASS		CURVE	LBLUE		
170	90	CSC	1	6.2	POT		RIM	CRMK	SAND	
170	90	CSC	7	13.2	POT		BODY	CRMK	SAND	
170	90	CSC	13	21.1	POT		BODY	PLAIN	SAND	
170	90	CSC		5.8	POT		BODYFG	PLAIN	SAND	
170	90	CSC	7	9.8	POT		BODY	PLAIN	SAND	
170	90	CSC	2	2.7	POT		BODY	PLAIN	SHELL	
170	90	CSC	2	10.5	POT		BASE	PLAIN	SAND	
170	90	CSC	2	1.6	POT		BODYFG	DEC	SAND	
170	90	CSC	3	1.9	METAL		FERS			
170	90	CSC	6	10.3	POT		BODY	DEC	SAND	WEA
170	90	CSC	13	16.3	POT		DAUB			
170	90	CSC	7	4.7	POT		PEL			
170	95	CSC	6	4.0	METAL		METOBJ			
170	95	CSC	1	1.3	EARTH		WHITE	BODY		
170	95	CSC	1	11.1	URM	PEBL	CRT			
170	95	CSC	1	3.5	GLASS		MLID	MILK		
170	95	CSC	16	9.7	POT		PEL			
170	95	CSC	10	20.2	POT		BODY	DEC	SAND	WEA
170	95	CSC	7	22.4	POT		BODY	CRMK	SAND	
170	95	CSC	5	9.2	POT		DAUB			
170	95	CSC	38	52.9	POT		BODY	PLAIN	SAND	
175	90	CSC	1	0.8	GLASS		CURVE	LAV		
175	90	CSC	1	1.2	GLASS		CURVE	CLEAR	EMBOSS	
175	90	CSC	1	0.6	GLASS		FLAT	CLEAR		
175	90	CSC	1	1.7	EARTH		WHITE	BODY		
175	90	CSC	1	6.8	STONE		ALBALB			
175	90	CSC	1	7.5	STONE		ALBBRS			
175	90	CSC	1	1.2	EARTH		WHITE	RIM		

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT						
175	90	CSC	1	10.9	POT		RIM	CRMK	SAND	
175	90	CSC	6	14.7	POT		BODY	CRMK	SAND	
175	90	CSC	14	21.7	POT		BODY	PLAIN	SAND	
175	90	CSC	1	2.7	POT		BODY	PLAIN	SAND	
175	90	CSC	2	2.5	GLASS		CURVE	CLEAR		
175	90	CSC	1	1.5	URM	CHNK	SS			
175	90	CSC	10	17.1	POT		DAUB			
175	95	CSC	3	6.7	POT		DAUB			
175	95	CSC	13	9.5	POT		PEL			
175	95	CSC	1	54.2	GRL		CHAA	GROUND	GRAD	
175	95	CSC	3	7.6	POT		BODY	CRMK	SAND	
175	95	CSC	5	8.1	POT		BODY	DEC	SAND	WEA
175	95	CSC	9	3.1	POT		BODY	PLAIN	SAND	
175	95	CSC	1	4.6	GLASS		CURVE	DGRN		
175	95	CSC	2	7.9	URM	PEBL	CRT			
175	95	CSC	1	0.3	URM	PEBL	QTZ			
175	95	CSC	1	0.4	METAL		METOBJ			
175	95	CSC	1	2.2	GLASS		CURVE	AGUA		
175	95	CSC	1	1.1	GLASS		MLID	MILK		
180	90	CSC	2	6.6	GLASS		CURVE	LAV		
180	90	CSC	3	3.4	POT		BODY	PLAIN	SAND	
180	90	CSC	1	4.6	GLASS		CURVE	CLEAR		
180	90	CSC	1	1.2	EARTH		WHITE	BODY		
180	90	CSC	1	0.2	STONE		ALBALB			
180	95	CSC	1	0.9	GLASS		MLID	MILK		
180	95	CSC	1	0.6	METAL		FERS	METOBJ		
180	95	CSC	1	0.2	CHIST		PIGEON			
180	95	CSC	1	0.9	EARTH		WHITE	BODY		
180	95	CSC	1	1.3	POT		BODY	PLAIN	SAND	
180	95	CSC	3	3.6	POT		PEL			
180	95	CSC	2	7.7	POT		BODY	CRMK	SAND	
180	95	CSC	1	3.3	POT		BODY	DEC	SAND	WEA
180	95	CSC	1	3.2	GLASS		LAV	EMBOSS	MOLD	
180	95	CSC	2	4.6	EARTH		WHITE	BASE		
180	95	CSC	1	0.9	GLASS		FLAT	LGRN		
180	95	CSC	1	1.3	GLASS		FLAT	LAV		
185	90	CSC	1	1.2	GLASS		FLAT	CLEAR		
185	90	CSC	1	12.5	STONE		ALBALB			
185	90	CSC	1	0.6	PORCE		MOLD			
185	90	CSC	2	3.2	EARTH		WHITE	BODY	MOLD	
185	90	CSC	1	2.3	EARTH		WHITE	BASE		
185	90	CSC	3	0.5	FOSSI		SHING			
185	90	CSC	3	2.3	POT		PEL			
185	90	CSC	2	17.2	POT		DAUB			
185	90	CSC	4	4.1	POT		BODY	PLAIN	SAND	
185	90	CSC	1	2.7	POT		BODY	CRMK	SAND	
185	90	CSC	3	9.4	GLASS		CURVE	LAV		
185	90	CSC	1	12.2	GLASS		BNECK	LGRN	MOLD	

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT					
185	90	CSC	1	1.6	GLASS	CURVE	LGRN		
185	90	CSC	1	7.1	GLASS	CLEAR	MELT		
185	90	CSC	3	10.7	EARTH	WHITE	RIM		
185	90	CSC	3	5.2	EARTH	WHITE	BODY		
185	95	CSC	1	1.0	GLASS	CURVE	COBALT		
185	95	CSC	1	2.0	OHIST	PIGEON			
185	95	CSC		4.0	POT	PEL			
185	95	CSC	1	0.6	POT	BODYFG	PLAIN	SHELL	
185	95	CSC	4	8.2	POT	BODY	PLAIN	SAND	
190	90	CSC	3	9.4	EARTH	WHITE	RIM		
190	90	CSC	1	7.7	GLASS	NECK	CLEAR	MOLD	STOPPE
190	90	CSC	1	1.1	STONE	ALBOTH			
190	90	CSC	6	10.4	EARTH	WHITE	BODY		
190	90	CSC		2.5	GLASS	CURVE	LAV		
190	90	CSC	1	0.6	GLASS	CURVE	CLEAR		
190	90	CSC	1	13.1	GLASS	BNECK	LAV		
190	90	CSC	1	4.2	GLASS	CURVE	GREEN		
190	90	CSC	1	1.3	POT	BODY	PLAIN	SHELL	
190	90	CSC	1	15.5	POT	DAUB			
190	90	CSC	1	0.5	GLASS	CURVE	LGRN		
190	90	CSC	1	0.9	POT	BODY	DEC	SAND	WEA
190	90	CSC	1	1.5	GLASS	CURVE	MILK		
190	90	CSC	3	22.1	METAL	FERS			
190	90	CSC	8	8.5	POT	BODY	PLAIN	SAND	
190	95	CSC	12	6.0	METAL	FERS			
190	95	CSC	2	18.0	METAL	FERS	METOBJ		
190	95	CSC	5	12.0	POT	BODY	CRMK	SAND	
190	95	CSC	9	12.0	POT	BODY	PLAIN	SAND	
190	95	CSC	1	3.1	METAL	NAIL			
190	95	CSC	2	0.3	URM CHNK	LS			
190	95	CSC	1	5.1	URM CHNK	CRT	FC		
190	95	CSC	1	1.1	GLASS	CURVE	MILK		
190	95	CSC	1	0.4	GHIST	PIGEON			
190	95	CSC	7	5.9	POT	DAUB			
190	95	CSC	1	0.4	POT	BODY	PLAIN	SHELL	
190	95	CSC	1	0.8	POT	BODY	CRMK	SAND	
190	95	CSC	1	1.6	POT	PEL			
190	95	CSC	8	6.3	POT	BODY	PLAIN	SHELL	
190	95	CSC	2	3.9	EARTH	WHITE	RIM		
190	95	CSC	1	2.8	GLASS	CURVE	LGRN		
190	95	CSC	1	2.0	GLASS	CURVE	LGRN	EMBOSS	
190	95	CSC	1	3.7	GLASS	CURVE	LAV		
190	95	CSC	1	3.5	GLASS	SQUARE	LAV		
190	95	CSC	1	0.8	GLASS	FLAT	CLEAR		
190	95	CSC	1	7.8	STONE	ALBALB			
190	95	CSC	4	7.1	EARTH	WHITE			
190	95	CSC	5	5.0	GLASS	CURVE	CLEAR		
190	95	CSC	2	4.4	GLASS	CURVE	BROWN		

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT					
195	60	CSC	6	45.5	GLASS		FLAT	CLEAR	
195	60	CSC	1	20.2	GLASS		CURVE	CLEAR	
195	60	CSC	2	1.0	GLASS		CURVE	BROWN	
195	60	CSC	1	10.0	GLASS		FLAT	LAV	MOLD
195	60	CSC	1	4.4	GLASS		MLID	MILK	
195	60	CSC	2	11.5	BRICK				
195	60	CSC	11	22.1	METAL		FERS	METOBJ	
195	60	CSC	2	1.5	GLASS		CURVE	LBLUE	
195	60	CSC	4	4.2	URM	CHNK			
195	60	CSC	1	0.4	POT		BODY	PLAIN SHELL	
195	60	CSC	1	0.5	URM	CHNK	CONG		
195	60	CSC	2	2.5	POT		BODY	PLAIN SAND	
195	60	CSC	1	0.6	GLASS		SQUARE	CLEAR	EMBOSS
195	60	CSC	1	23.5	STONE		ALBALB		
195	65	CSC	1	1.6	GLASS		CURVE	LAV	
195	65	CSC	1	16.3	POT		MDLOBJ	POLIS	
195	65	CSC	1	99.3	BRICK				
195	65	CSC	1	0.4	URM	CHNK	FC		
195	70	CSC		6.8	POT		PEL		
195	70	CSC	3	10.4	GLASS		CURVE	CLEAR	
195	70	CSC	1	2.4	POT		BODY	CRMK SAND	
195	70	CSC	3	5.7	POT		BODY	PLAIN SAND	
195	70	CSC	1	30.4	METAL		FERS	METOBJ	
195	70	CSC	2	1.8	BRICK		FR		
195	70	CSC	1	0.7	GLASS		CURVE	BROWN	
195	70	CSC	1	182.4	STONE		CHURN	ALBALB	
195	75	CSC	2	4.7	POT		BODY	CRMK SAND	
195	75	CSC	3	1.9	POT		BODYFG	SAND	
195	75	CSC	1	98.0	URM	COBL			
195	75	CSC	2	7.4	POT		BODY	PLAIN SAND	
195	75	CSC	2	0.7	GLASS		FLAT	CLEAR	
195	75	CSC	1	1.2	GLASS		CURVE	LAV	
195	75	CSC	3	1.7	POT		BODY	PLAIN SHELL	
195	75	CSC	1	1.0	POT		BODY	PLAIN GROG	
195	80	CSC	1	1.5	GLASS		CURVE	CLEAR	
195	80	CSC	1	4.4	EARTH		WHITE	RIM	UNDEC
195	80	CSC	1	13.3	GLASS		BNECK	LGRN	STOPPE
195	80	CSC	2	4.3	GLASS		CURVE	LAV	
195	80	CSC		66.5	METAL		FERS	METOBJ	
195	80	CSC		18.4	POT		PEL		
195	80	CSC	4	3.1	POT		BODYFG	PLAIN SAND	
195	80	CSC	1	4.2	POT		BODY	PLAIN SAND	
195	84	1X1M	2	1.1	POT		BODY	PLAIN SHELL	
195	84	1X1M		69.8	POT		BODYFG	PLAIN SAND	
195	84	1X1M	11	34.4	POT		PEL		
195	84	1X1M	1	0.4	POT		BODYFG	PLAIN SAND	
195	84	1X1M	8	9.2	POT		BODY	PLAIN SHELL	
195	84	1X1M	3	5.0	POT		BODY	PLAIN SAND	

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT						
195	84	1X1M	6	19.2	POT		BODY	CRMK	SAND	
195	84	1X1M	6	11.6	POT		BODY	PLAIN	SAND	
195	84	1X1M	1	5.7	POT		BODY	RED	SHELL	
195	84	1X1M	6	2.5	POT		DAUB			
195	84	1X1M	2	1.0	POT		BODY	PLAIN	SHELL	
195	84	1X1M	1	8.2	POT		BODY	CRMK	SAND	
195	84	1X1M		3.5	POT		BODYFG	PLAIN	SHELL	
195	84	1X1M	3	16.2	POT		DAUB			
195	84	1X1M	1	2.1	GLASS		CURVE	CLEAR		
195	84	1X1M	3	2.4	POT		BODY	RED	SHELL	
195	84	1X1M	9	26.5	POT		BODY	CRMK	SAND	
195	84	1X1M	32	21.3	POT		BODY	PLAIN	SHELL	
195	84	1X1M	2	5.6	METAL		NAIL			
195	84	1X1M		67.2	POT		PEL			
195	84	1X1M	1	0.5	EARTH		WHITE	BODY	UNDEC	
195	84	1X1M		18.0	METAL		FERS			
195	84	1X1M	1	0.6	GLASS		CURVE	BROWN		
195	84	1X1M	1	1.2	GLASS		FLAT	LGRN		
195	84	1X1M	1	16.3	STONE		ALBALB			
195	84	1X1M	7	2.9	GLASS		CURVE	CLEAR		
195	84	1X1M		18.2	POT		PEL			
195	84	1X1M	1	3.1	POT		BODY	CRMK	SAND	
195	84	1X1M	3	1.8	CL	SHAT	CRT			
195	84	1X1M		52.2	POT		BODYFG	PLAIN	SAND	
195	84	1X1M	1	4.4	METAL		NAIL			
195	84	1X1M	1	11.9	STONE		HANDLE	ALBALB		
195	84	1X1M		18.8	METAL		FERS			
195	84	1X1M	1	0.3	GLASS		CURVE	LGRN		
195	84	1X1M	9	56.7	POT		BODY	CRMK	SAND	
195	84	1X1M	2	1.2	URM	CHNK	CRT	FC		
195	84	1X1M		78.0	POT		PEL			
195	84	1X1M		21.1	POT		BODYFG	SHELL		
195	84	1X1M	1	24.7	POT		BODY	CRMK	ENGRA	SAND
195	84	1X1M	22	30.4	POT		BODYFG	PLAIN	SAND	
195	84	1X1M		111.7	POT		PEL			
195	84	1X1M	13	5.5	POT		BODYFG	PLAIN	SHELL	
195	84	1X1M	3	3.5	POT		BODY	RED	SHELL	
195	84	1X1M	2	12.7	POT		BODY	PLAIN	SHELL	
195	84	1X1M	1	15.6	POT		DAUB			
195	84	1X1M	1	2.0	FLOR		CHARC			
195	84	1X1M	1	18.9	POT		RIM	DEC	SHELL	
195	84	1X1M	2	32.0	POT		DAUB			
195	84	1X1M	1	2.3	POT		BODY	PLAIN	SAND	
195	84	1X1M		27.1	POT		PEL			
195	84	1X1M	10	12.4	POT		BODY	RED	SHELL	
195	84	1X1M		15.3	POT		BODYFG	SAND		
195	84	1X1M	8	5.6	POT		BODY	RED	SHELL	
195	84	1X1M	11	29.5	POT		BODY	PLAIN	SAND	

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT #	CT	WT							
195	84	1X1M	16	64.8	POT		BODY	CRMK	SAND		
195	84	1X1M	7	18.5	POT		BODY	PLAIN	SHELL		
195	85	CSC	1	0.9	POT		BODY	PLAIN	SHELL		
195	85	CSC		7.7	POT		PEL				
195	85	CSC	4	6.7	POT		BODY	PLAIN	SAND		
195	85	CSC	1	2.0	GLASS		CURVE	MILK	MOLD		
195	85	CSC	2	1.5	GLASS		FLAT	CLEAR			
195	85	CSC	1	11.0	GLASS		BNECK	LGRN	SCOLLA		
195	85	CSC	1	0.4	CL	FLA	CRT				
195	85	CSC	1	0.7	METAL		FERS				
195	85	CSC	2	10.3	EARTH		WHITE	RIM	UNDEC		
195	90	CSC	2	1.8	POT		BODY	PLAIN	SHELL		
195	90	CSC	2	17.0	POT		DAUB				
195	90	CSC	1	4.9	POT		BODY	CRMK	SAND		
195	90	CSC	1	1.8	POT		BODY	DEC	SAND	WEA	
195	90	CSC	1	0.6	GLASS		FLAT	CLEAR			
195	90	CSC	1	3.8	GLASS		CURVE	LBLUE			
195	90	CSC	4	6.5	POT		PEL				
195	90	CSC	3	3.1	GLASS		CURVE	CLEAR			
195	90	CSC	1	12.2	STONE		ALBALB				
195	90	CSC	1	2.8	STONE		BUFF				
195	90	CSC	1	2.4	FOSSI		SHING				
195	90	CSC	1	37.6	METAL		FERS	METOBJ			
195	90	CSC	1	0.5	EARTH		WHITE	BODY	MARPAR		
195	90	CSC	4	4.9	POT		BODY	PLAIN	SAND		
195	90	CSC	2	3.3	EARTH		WHITE	BODY			
195	90	CSC	1	2.0	METAL		FERS				
195	95	CSC	9	12.0	POT		BODY	PLAIN	SAND		
195	95	CSC	1	1.5	POT		BODY	PLAIN	SHELL		
195	95	CSC	1	2.3	POT		BODY	RED	SHELL		
195	95	CSC	2	6.7	POT		BODY	CRMK	SAND		
195	95	CSC	1	2.3	GLASS		BBASE	LGRN			
195	95	CSC	1	3.5	METAL		FERS				
195	95	CSC	1	18.4	STONE		ALBALB				
195	95	CSC	1	1.3	GLASS		CURVE	CLEAR			
590	90	CSC	1	0.1	ANIM		BONE				
	40	CSC	1	1.5	POT		BODY	DEC	SAND	WEA	
		GENE	5	29.0	POT		BODY	PLAIN	SHELL		
		GENE	1	3.1	CL	FLA	RUM	CRT			
		GENE	1	3.8	STONE		ALBOTH				
		GENE	2	3.7	POT		BODY	PLAIN	SAND		
		GENE	1	3.3	POT		BODY	PLAIN	SHELL		
		GENE	4	11.0	POT		BODY	CRMK	SAND		
		GENE	1	8.5	GLASS		BBASE	LBLUE	MOLD	EMBOSS	SBASAL
		GENE	1	2.1	PORCE		MOLD				
		GENE	1	1.5	EARTH		WHITE	UNDEC			
		GENE	1	1.5	BRICK						
		GENE	1	0.6	CL	FLA	CRT	CTX			

TABLE C-5
3MS119 ARTIFACTS

N	E	UNIT	#	CT	WT						
		GENE		1	5.0	CL	FLA	RUM	CRT	CTX	
		GENE		1	1.3	GLASS		SQUARE	CLEAR		
		GENE		2	10.9	STONE		BRSBRS			
		GENE		1	5.6	GLASS		JAR	LAV	MOLD	FR
		GENE		1	0.8	SYN		IND			
		GENE		1	16.0	GLASS		BASE	BLUE	MOLD	SBASAL
		GENE		1	57.9	STONE		RIM	BRSBRS		
		GENE		1	7.6	BRICK					
		GENE		2	11.5	POT		DAUB			
		GENE		1	0.6	EARTH		WHITE	DECAL	HPAINT	
		GENE		1	1.1	STONE		ALBBRS			
		GENE		2	9.8	STONE		ALBSAL			
		GENE		1	0.1	CL	FLA	RUM	CRT		
		GENE		5	9.0	CL	FLA	CRT			
		GENE		1	8.0	CL	CORE	MDIR	CRT	FR	
		GENE		1	0.1	CL	SHAT	CRT			
		GENE		1	452.2	GRL		HAM	BAT	QZIT	
		GENE		1	28.1	URM	CHNK	CRT			
		GENE		1	1.9	POT		BODY	PLAIN	SAND	
		GENE		1	108.1	URM	CHNK	QTZ			
		GENE		1	2.0	POT		BODY	PLAIN	SHELSA	
		GENE		11	16.7	POT		BODY	PLAIN	SAND	
		GENE		1	0.1	METAL		FERS			
		GENE		1	2.1	METAL		ALUM	THIMBL		
		GENE		1	1.5	GLASS		CURVE	LAV		
		GENE		1	1.2	GLASS		CURVE	BLUE		
		GENE		1	24.5	BRICK					
		GENE		3	4.4	POT		PEL			
		GENE		1	3.2	POT		BODY	CRMK	GROG	
		GENE		1	2.6	SHELL					
		GENE		1	1.4	URM	CHNK	QZIT			
		CC	51	1	1.1	POT		BODY	CRMK	SAND	
		CC	51	1	2.9	GLASS		CURVE	BROWN		
		CC	51	2	1.7	POT		BODY	PLAIN	SAND	

Number of artifacts in printout: 754
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 3:38

TABLE C-6 3MS119 ARTIFACTS FROM TEST UNIT BY DEPTH

MINARK D.B.S. V4.0

Database name: ARTFORM
This retrieval performed: 22Sep86 0:2
Data last updated: 19Sep86 0:14
Total artifacts in database with data: 3614
# of artifacts excluded by security rating: 0

Subset name: 3MS119B # of artifacts in subset: 57

Cumulative selection criteria:
SND = 3MS119 ;
UNIT = 1X1M ;

All artifacts selected

—) BDEPTH = 20

144	94	1X1M 1	10.00	20.30	1	2.0	POT		BODY	RED	SHELL
195	84	1X1M	0.00	20.00	3	1.8	CL	SHAT	CRT		
195	84	1X1M	0.00	20.00	7	2.9	GLASS		CURVE	CLEAR	
195	84	1X1M	0.00	20.20	1	1.2	GLASS		FLAT	LGRN	
195	84	1X1M	0.20	20.20		3.5	POT		BODYFG	PLAIN	SHELL
195	84	1X1M	0.00	20.00		69.6	POT		BODYFG	PLAIN	SAND
195	84	1X1M	0.20	20.30	1	3.1	POT		BODY	CRMK	SAND
195	84	1X1M	-0.20	20.00		18.2	POT		PEL		
195	84	1X1M	0.20	20.20	1	4.4	METAL		NAIL		
195	84	1X1M	0.20	20.00		18.8	METAL		FERS		
195	84	1X1M	0.30	20.00	1	16.9	STONE		ALBALB		
195	84	1X1M	0.20	20.20	1	11.9	STONE		HANDLE	ALBALB	

CT	16.00	2.000	16.00
WT	154.50	12.875	154.50

—) BDEPTH = 30

195	84	1X1M	20.00	30.00	1	0.5	EARTH	WHITE	BODY	UNDEC
195	84	1X1M	20.00	30.00	1	0.6	GLASS	CURVE	BROWN	
195	84	1X1M	20.20	30.00	1	2.1	GLASS	CURVE	CLEAR	
195	84	1X1M	20.00	30.00		67.2	POT	PEL		
195	84	1X1M	20.00	30.20	32	21.3	POT	BODY	PLAIN	SHELL
195	34	1X1M	20.00	30.00	9	25.5	POT	BODY	CRMK	SAND
195	84	1X1M	20.00	30.00		52.2	POT	BODYFG	PLAIN	SAND
195	84	1X1M	20.00	30.00	3	16.2	POT	DAUB		
195	84	1X1M	20.00	30.20	3	2.4	POT	BODY	RED	SHELL
195	84	1X1M	20.00	30.00		18.0	METAL	FERS		
195	84	1X1M	20.00	30.20	2	5.6	METAL	NAIL		

TABLE C-6   3MS119 ARTIFACTS FROM TEST UNIT BY DEPTH

N	E	UNIT #	TOP	BOTTM	CT	WT				
CT			52.00		6.500		68.00			
WT			212.60		19.327		367.10			

—) BDEPTH = 40

195	84	1X1M	30.00	40.00	1	0.3	GLASS	CURVE	LGRN	
195	84	1X1M	30.00	40.00		21.1	POT	BODYFS	SHELL	
195	84	1X1M	30.00	40.00		78.0	POT	PEL		
195	84	1X1M	30.00	40.00	1	15.6	POT	DAUB		
195	84	1X1M	30.00	40.00	16	64.8	POT	BODY	CRMK	SAND
195	84	1X1M	30.00	40.00	10	12.4	POT	BODY	RED	SHELL
195	84	1X1M	30.00	40.00	7	18.5	POT	BODY	PLAIN	SHELL
195	84	1X1M	30.00	40.00		15.3	POT	BODYFS	SAND	
195	84	1X1M	30.00	40.00	11	29.5	POT	BODY	PLAIN	SAND
195	84	1X1M	30.00	40.00	2	1.2	URM	CHNK	CRT	FC
CT			46.00		6.857		116.00			
WT			256.70		25.670		623.80			

—) BDEPTH = 50

195	84	1X1M	40.00	50.00	13	5.5	POT	BODYFS	PLAIN	SHELL
195	84	1X1M	40.00	50.00	22	30.4	POT	BODYFS	PLAIN	SAND
195	84	1X1M	40.00	50.00		111.7	POT	PEL		
195	84	1X1M	40.00	50.00	1	24.7	POT	BODY	CRMK	ENGRA SAND
195	84	1X1M	40.00	50.00	9	56.7	POT	BODY	CRMK	SAND
195	84	1X1M	40.00	50.00	2	12.7	POT	BODY	PLAIN	SHELL
195	84	1X1M	40.00	50.00	3	3.5	POT	BODY	RED	SHELL
CT			50.00		8.333		166.00			
WT			245.20		35.029		869.00			

—) BDEPTH = 60

195	84	1X1M	50.00	60.00	1	2.0	FLOR	CHARC		
195	84	1X1M	50.00	60.00		27.1	POT	PEL		
195	84	1X1M	50.00	60.00	2	32.0	POT	DAUB		
195	84	1X1M	50.00	60.00	1	2.3	POT	BODY	PLAIN	SAND
195	84	1X1M	50.00	60.00	8	9.2	POT	BODY	PLAIN	SHELL
195	84	1X1M	50.00	60.00	8	5.6	POT	BODY	RED	SHELL
195	84	1X1M	50.00	60.00	3	5.0	POT	BODY	PLAIN	SAND
195	84	1X1M	50.00	60.00	6	19.2	POT	BODY	CRMK	SAND
CT			29.00		4.143		195.00			
WT			102.40		12.800		971.40			

—) BDEPTH = 70

195	84	1X1M	60.00	70.00	6	11.6	POT	BODY	PLAIN	SAND
195	84	1X1M	60.00	70.00	6	2.5	POT	DAUB		

TABLE C-6 3MS119 ARTIFACTS FROM TEST UNIT BY DEPTH

N	E	UNIT #	TOP	BOTTM	CT	WT				
195	84	1X1M	60.00	70.00	1	13.9	POT	RIM	DEC	SHELL
195	84	1X1M	60.00	70.00	2	1.1	POT	BODY	PLAIN	SHELL
195	84	1X1M	60.00	70.00	1	5.7	POT	BODY	RED	SHELL

CT	16.00	3.200	211.00
WT	39.60	7.960	1811.20

—) BDEPTH = 80

195	84	1X1M	70.00	80.00	11	34.4	POT	PEL		
195	84	1X1M	70.00	80.00	1	0.4	POT	BODYFS	PLAIN	SAND
195	84	1X1M	70.00	80.00	1	8.2	POT	BODY	CRMK	SAND
195	84	1X1M	70.00	80.00	2	1.0	POT	BODY	PLAIN	SHELL

BDEPTH = 80

Number of artifacts in printout: 57
# of artifacts excluded by security rating: 0

Output completed: 22Sep86 0:2

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT #	CT	WT						
100	80	CSC	2	3.1	POT		BODY	PLAIN	SAND	
100	95	CSC	2	1.5	POT		BODYFG	SAND		
100	95	CSC	1	0.5	POT		PEL			
100	95	CSC	1	0.6	POT		BODYFG	SHELL		
100	120	CSC	1	1.4	POT		BODY	PLAIN	SAND	
105	80	CSC	1	1.8	POT		RIM	PLAIN	SAND	
105	80	CSC	1	3.3	POT		BODY	CRMK	SAND	
105	80	CSC	2	3.3	POT		BODY	PLAIN	SAND	
105	95	CSC	2	2.8	POT		BODYFG	SAND		
105	95	CSC	2	2.7	POT		BODYFG	SAND		
105	115	CSC	3	2.6	POT		BODY	PLAIN	SAND	
110	80	CSC	1	0.9	POT		DEB			
110	80	CSC	2	4.0	POT		BODY	PLAIN	SAND	
110	80	CSC	1	3.5	POT		RIM	PLAIN	SAND	
110	95	CSC	1	3.2	POT		BODY	PLAIN	SAND	
110	95	CSC	2	2.9	POT		BODY	CRMK	SAND	
110	95	CSC	3	2.5	POT		PEL			
110	95	CSC	1	2.3	POT		DAUB			
110	95	CSC	1	1.0	POT		BODYFG	SHELL		
110	95	CSC	7	6.4	POT		BODYFG	SAND		
110	95	CSC	1	2.4	POT		BODYFG	GROG		
110	115	CSC	1	80.8	GRL		ABRAD	PITS	LS	
110	120	CSC	2	2.5	POT		BODY	PLAIN	SAND	
115	80	CSC	1	1.5	POT		BODYFG	CRMK	SAND	
115	80	CSC	1	1.1	CL	FLA	RUM	CRT		
115	80	CSC	7	10.0	POT		BODYFG	PLAIN	SAND	
115	95	CSC	1	1.4	POT		DAUB			
115	95	CSC	4	2.4	POT		BODYFG	SAND		
115	95	CSC	3	7.7	POT		BODY	PLAIN	SAND	
115	95	CSC	4	13.8	POT		BODY	CRMK	SAND	
115	95	CSC	4	2.6	POT		PEL			
115	95	CSC	1	1.5	POT		BODY	DEC	SAND	WEA
115	95	CSC	1	0.6	POT		BODYFG	SAND		
115	115	CSC	3	4.2	POT		BODY	DEC	SAND	WEA
115	115	CSC	1	36.0	CL	CORE	HAM	CRT		
115	120	CSC	1	0.3	POT		BODY	PLAIN	SAND	
120	80	CSC	1	2.5	POT		BODY	CRMK	SAND	
120	80	CSC	1	2.4	POT		PEL			
120	80	CSC	1	0.8	POT		BODYFG	PLAIN	SAND	
120	95	CSC	2	5.5	POT		BODY	PLAIN	SAND	
120	95	CSC	3	5.3	POT		BODY	CRMK	SAND	
120	95	CSC	8	5.4	POT		BODYFG	SAND		
120	95	CSC	1	1.4	POT		DAUB			
120	95	CSC	1	0.6	POT		BODYFG	SHELL		
120	115	CSC	1	1.5	POT		BODY	PLAIN	SAND	
120	115	CSC	4	6.8	POT		BODY	DEC	SAND	WEA
120	115	CSC	5	11.3	POT		BODY	CRMK	SAND	
120	115	CSC	1	35.2	CL	CORE	CRT			

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT #	CT	WT						
120	115	CSC	2	0.3	POT		BODYFG	SAND		
120	120	CSC	2	1.6	POT		BODY	PLAIN	SAND	
125	80	CSC		4.8	POT		BODYFG	PLAIN	SAND	
125	80	CSC		0.4	POT		PEL			
125	80	CSC	1	7.4	POT		BODY	CRMK	SAND	
125	95	CSC	6	14.6	POT		BODY	CRMK	SAND	
125	95	CSC	1	6.8	CL	FLA	CRT			
125	95	CSC	1	2.2	POT		DAUB			
125	95	CSC	1	1.9	POT		BODY	FINS	SAND	WEA
125	95	CSC	3	9.0	POT		BODY	PLAIN	SAND	
125	95	CSC	8	6.2	POT		BODYFG	SAND		
125	115	CSC	2	13.6	POT		BODY	CRMK	SAND	
125	115	CSC		0.9	POT		BODYFG	SAND		
125	115	CSC	1	1.2	POT		BODY	INCI	SHELL	
125	115	CSC	1	0.8	POT		BODY	PLAIN	SHELL	
125	115	CSC	1	2.6	POT		BODY	PLAIN	SAND	
125	115	CSC	1	1.0	POT		BODY	DEC	SAND	WEA
125	120	CSC	1	7.5	POT		PEL			
125	120	CSC	8	20.1	POT		BODY	PLAIN	SAND	
125	120	CSC	3	12.1	POT		BODY	CRMK	SAND	
125	120	CSC		5.3	POT		BODYFG	SAND		
130	80	CSC	1	5.9	BRICK					
130	80	CSC		5.0	POT		DAUB			
130	80	CSC		17.6	POT		BODYFG	PLAIN	SAND	
130	80	CSC	1	0.6	URN	CHNK	CRT	FC		
130	80	CSC		2.9	POT		PEL			
130	80	CSC	8	16.7	POT		BODY	CRMK	SAND	
130	80	CSC	1	10.4	POT		BODY	RED	SHELL	
130	80	CSC	7	15.3	POT		BODY	PLAIN	SAND	
130	80	CSC	1	1.8	POT		RIM	CRMK	SAND	
130	80	CSC	2	0.3	CL	FLA	CRT			
130	95	CSC	1	1.9	POT		DEB			
130	95	CSC	6	27.2	POT		BODY	CRMK	SAND	
130	95	CSC	1	3.5	POT		BODY	DEC	WEA	
130	95	CSC	1	3.9	GLASS		CURVE	LAV		
130	95	CSC	4	13.9	POT		DAUB			
130	95	CSC	14	14.6	POT		BODYFG	SAND		
130	95	CSC	9	25.0	POT		BODY	PLAIN	SAND	
130	115	CSC	1	3.4	POT		DAUB			
130	115	CSC	1	0.1	CL	FLA	CRT			
130	115	CSC	1	1.5	POT		PEL			
130	115	CSC	7	25.5	POT		BODY	CRMK	SAND	
130	115	CSC	1	0.2	POT		BODYFG	SAND		
130	120	CSC	3	4.9	POT		BODY	PLAIN	SAND	
135	80	CSC		7.4	POT		PEL			
135	80	CSC	2	1.7	POT		RIM	PLAIN	SAND	
135	80	CSC		12.5	POT		BODYFG	PLAIN	SAND	
135	80	CSC	8	19.0	POT		BODY	CRMK	SAND	

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT #	CT	WT						
135	80	CSC	6	13.1	POT		BODY	PLAIN	SAND	
135	90	CSC	1	0.4	POT		BODY	PLAIN	SHELL	
135	95	CSC	3	9.5	POT		BODY	PLAIN	SAND	
135	95	CSC	1	0.5	POT		BODYFG	SAND		
135	95	CSC	1	1.3	POT		BODYFG	SAND		
135	95	CSC	2	5.1	POT		BODY	CRMK	SAND	
135	115	CSC	1	2.3	POT		BODY	PLAIN	SAND	
135	115	CSC	1	5.4	POT		BODY	DEC	GROG	WEA
135	115	CSC	1	2.9	POT		DAUB			
135	115	CSC	2	3.3	POT		PEL			
135	120	CSC	1	0.3	CL	FLA	DECORT	CRT		
135	120	CSC	6	4.7	POT		BODY	PLAIN	SAND	
135	120	CSC	1	6.1	URM	CHNK	CRT			
140	40	CSC	1	0.7	POT		PEL			
140	50	CSC	1	2.0	POT		RIM	PLAIN	SAND	
140	55	CSC	2	3.9	POT		BODY	PLAIN	SAND	
140	60	CSC	1	0.7	POT		PEL			
140	60	CSC	1	0.8	POT		BODY	PLAIN	SAND	
140	65	CSC	1	6.0	POT		BODY	CRMK	SAND	
140	65	CSC	12	23.0	POT		BODY	PLAIN	SAND	
140	65	CSC	4	2.5	POT		BODYFG	PLAIN	SAND	
140	65	CSC	1	8.2	URM	CHNK	CRT			
140	70	CSC	5	10.4	POT		BODY	CRMK	SAND	
140	70	CSC	10	12.5	POT		BODY	PLAIN	SAND	
140	75	CSC	23	38.6	POT		BODY	PLAIN	SAND	
140	75	CSC	1	0.3	URM	CHNK	CRT	FC		
140	75	CSC	9	17.7	POT		BODY	CRMK	SAND	
140	75	CSC	5	7.9	POT		BODY	DEC	SAND	WEA
140	75	CSC	3	2.0	POT		PEL			
140	75	CSC	1	0.3	POT		BODY	PLAIN	SHELL	
140	80	CSC	6	10.5	POT		BODY	PLAIN	SAND	
140	80	CSC	5	8.2	POT		BODY	CRMK	SAND	
140	80	CSC		7.3	POT		BODYFG	PLAIN	SAND	
140	80	CSC		30.7	BRICK					
140	80	CSC		5.4	POT		PEL			
140	85	CSC	1	3.0	CL	FLA	SCR	RUM	CRT	HT
140	85	CSC	6	3.0	POT		PEL			
140	85	CSC	1	1.1	POT		DAUB			
140	85	CSC	4	8.9	POT		BODY	CRMK	SAND	
140	85	CSC	20	28.8	POT		BODY	PLAIN	SAND	
140	85	CSC	7	15.4	POT		BODY	DEC	SAND	WEA
140	85	CSC	1	0.9	METAL		FERS			
140	85	CSC	1	0.5	URM	CHNK	CRT	FC		
140	90	CSC	1	1.5	CL	FLA	CRT			
140	90	CSC	1	0.9	URM	CHNK	CRT	FC		
140	90	CSC	2	2.2	POT		BODY	SHELL		
140	90	CSC	1	2.2	POT		BEAD	CYLND		
140	90	CSC	1	1.4	POT		BODY	DEC	SAND	WEA

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT	#	CT	WT						
140	90	CSC		7	10.6	POT		BODY	PLAIN	SAND	
140	90	CSC		1	15.8	CL	BIFK	DART	CORNT	EXPNST	CRT
140	90	CSC		10	20.5	POT		BODY	CRMK	SAND	
140	90	CSC		7	25.0	POT		DAUB			
140	95	CSC		5	13.7	POT		BODY	CRMK	SAND	
140	95	CSC		2	2.1	POT		BODY	PLAIN	SAND	
140	95	CSC		1	1.2	POT		BODY	PLAIN	SAND	
140	95	CSC		1	1.8	POT		BODY	PLAIN	SHELL	
140	95	CSC		2	4.6	POT		BODY	CRMK	SAND	
140	95	CSC		7	3.2	POT		BODYFG	SAND		
140	95	CSC		1	0.3	ANIM		IND			
140	95	CSC		1	0.6	POT		PEL			
140	115	CSC		1	0.7	POT		BODYFG	PLAIN	SAND	
140	115	CSC		2	14.9	URM	CHNK	SS			
140	120	CSC		3	4.1	POT		BODY	PLAIN	SAND	
144	94	1X1M	1	1	1.0	CL	BIFK	PPK	CRT	DS	
144	94	1X1M	1	2	24.4	POT		BODY	CRMK	SAND	
144	94	1X1M	1	1	2.0	POT		BODY	RED	SHELL	
144	94	1X1M	1	3	6.2	POT		BODY	PLAIN	SHELL	
144	94	1X1M	1		39.8	POT		PEL			
144	94	1X1M	1	3	2.8	URM	CHNK	CRT			
144	94	1X1M	1	22	61.4	POT		BODY	CRMK	SAND	
144	94	1X1M	1	10	21.2	POT		BODY	PLAIN	SAND	WEA
144	94	1X1M	1		74.0	POT		BODYFG	PLAIN	SAND	WEA
144	94	1X1M	1	18	72.1	POT		BODY	DEC	SAND	WEA
144	94	1X1M	1	22	123.1	POT		BODY	CRMK	SAND	
144	94	1X1M	1	29	24.5	POT		DAUB			
144	94	1X1M	1	1	0.1	FLOR		CHARC			
144	94	1X1M	1	10	28.6	POT		BODY	PLAIN	SAND	
144	94	1X1M	1	1	3.4	POT		RIM	CRMK	SAND	
144	94	1X1M	1	1	0.4	URM	PEBL	CRT			
144	94	1X1M	1	2	0.8	POT		BODY	PLAIN	SHELL	
144	94	1X1M	1	1	1.7	POT		BODY	FING	SAND	
144	94	1X1M	1		36.7	POT		BODYFG	SAND		
144	94	1X1M	1	1	1.5	POT		BODY	PLAIN	SHELL	
144	94	1X1M	1	1	0.5	POT		BODY	PLAIN	SHELL	
144	94	1X1M	1	1	0.3	POT		RIMFG	PLAIN	SAND	
144	94	1X1M	1	7	20.7	POT		DAUB			
144	94	1X1M	1	4	1.5	URM		CANC			
144	94	1X1M	1	1	1.8	CL	FLA	CRT			
144	94	1X1M	1	13	20.4	POT		BODY	PLAIN	SAND	
144	94	1X1M	1	17	39.4	POT		BODY	CRMK	SAND	
144	94	1X1M	1		3.4	POT		PEL			
144	94	1X1M	1	1	6.6	POT		BODY	PLAIN	SAND	
144	94	1X1M	1	4	9.4	POT		BODY	PLAIN	SAND	
144	94	1X1M	1	1	21.7	POT		PPO			
144	94	1X1M	1	1	0.2	URM	PEBL				
144	94	1X1M	1	1	2.0	POT		BODY	FING	SAND	

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT	#	CT	WT						
144	94	1X1M	1		2.7	POT		PEL			
144	94	1X1M	1	2	3.8	POT		DAUB			
144	94	1X1M	1	1	4.2	POT		PPO	FR		
144	94	1X1M	1	5	32.1	POT		DAUB			
144	94	1X1M	1	2	5.6	POT		BODY	PLAIN	SAND	
144	94	1X1M	1		0.6	POT		BODYFG	SAND		
144	94	1X1M	1	1	8.2	POT		RIM	CRMK	SAND	
144	94	1X1M	1	1	4.8	POT		BODY	DEC	SAND	WEA
144	94	1X1M	1	3	5.6	POT		PEL			
144	94	1X1M	1	3	2.4	POT		BODY	CRMK	SAND	
144	94	1X1M	1	1	0.2	URM	CHNK	CRT			
144	94	1X1M	1	1	0.6	URM	PEBL				
144	94	1X1M	1	9	29.2	POT		BODY	CRMK	SAND	
144	94	1X1M	1	1	0.1	FLOR		CHARC			
144	94	1X1M	1		25.6	POT		BODYFG	PLAIN	SAND	
144	94	1X1M	1		18.4	POT		PEL			
144	94	1X1M	1		0.6	METAL		FERS			
144	94	1X1M	1		14.3	POT		[illegible]	DEC	SAND	
144	94	1X1M	1	2	1.9	POT		BODY	PLAIN	SAND	
144	94	1X1M	1	2	2.7	POT		BODY	SAND	WEA	
144	120	ST	2		79.5	POT		BODYFG	PLAIN	SAND	
144	120	1X1M	2	3	4.2	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2	1	15.1	POT		BODY	DEC	GROG	
144	120	1X1M	2	27	164.0	POT		BODY	CRMK	SAND	
144	120	1X1M	2		6.3	POT		BODYFG	SAND		
144	120	1X1M	2	11	9.4	POT		BODY	PLAIN	SAND	
144	120	1X1M	2	8	2.2	POT		BODYFG	GROG		
144	120	1X1M	2	10	4.3	POT		PEL			
144	120	1X1M	2		2.2	POT		DAUB			
144	120	1X1M	2	2	0.8	CL	FLA	CRT			
144	120	1X1M	2		48.8	POT		PEL			
144	120	1X1M	2		49.0	POT		BODYFG	PLAIN	SAND	
144	120	1X1M	2	2	1.2	URM	SHAT				
144	120	1X1M	2	1	0.8	CL	FLA	CRT			
144	120	1X1M	2	2	17.6	POT		BODY	CRMK	SAND	
144	120	1X1M	2	2	0.7	ANIM					
144	120	1X1M	2	2	1.9	URM	CHNK	CRT	FC		
144	120	1X1M	2	2	2.9	POT		BODYFG	DEC	SAND	
144	120	1X1M	2	1	3.2	POT		RIM	PLAIN	SHELSA	
144	120	1X1M	2	5	23.6	POT		BODY	DEC	SAND	WEA
144	120	1X1M	2	13	7.3	POT		BODY	CRMK	SAND	
144	120	1X1M	2		15.0	POT		PEL			
144	120	1X1M	2	2	3.5	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2		1.3	POT		BODYFG	SHELL		
144	120	1X1M	2		33.9	POT		BODYFG	SAND		
144	120	1X1M	2	1	10.8	POT		BODY	CRMK	SAND	
144	120	1X1M	2	2	29.6	POT		RIM	CRMK	SAND	
144	120	1X1M	2	4	6.3	POT		BODY	CRMK	SAND	

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT	#	CT	WT						
144	120	1X1M	2	1	1.9	METAL		TIN	METOBJ		
144	120	1X1M	2	1	2.9	POT		BODY	SAND	WEA	
144	120	1X1M	2	2	60.8	POT		RIM	CRMK	SAND	
144	120	1X1M	2	8	23.4	POT		BODY	PLAIN	SAND	
144	120	1X1M	2		51.2	POT		PEL			
144	120	1X1M	2	27	107.6	POT		BODY	CRMK	SAND	
144	120	1X1M	2	10	40.4	POT		DAUB			
144	120	1X1M	2		76.7	POT		PEL			
144	120	1X1M	2	31	106.5	POT		BODY	PLAIN	SAND	
144	120	1X1M	2	1	1.6	CL	FLA	DECORT	CRT		
144	120	1X1M	2	1	0.5	CL	FLA	CRT			
144	120	1X1M	2	1	3.7	POT		BODY	FINS	SAND	
144	120	1X1M	2	4	1.5	URM	PEBL				
144	120	1X1M	2	2	9.0	POT		BODY	RED	SHELSA	
144	120	1X1M	2	2	2.8	POT		BODY	PLAIN	SHELSA	
144	120	1X1M	2	2	1.3	URM	CHNK	CRT	FC		
144	120	1X1M	2	1	4.6	POT		RIM	PLAIN	SAND	
144	120	1X1M	2	8	1.7	POT		BODYFG	PLAIN	SHELL	
144	120	1X1M	2	16	11.6	POT		BODYFG	PLAIN	SHELL	
144	120	1X1M	2	2	2.2	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2	5	0.4	POT		BODYFG	PLAIN	SHELSA	
144	120	1X1M	2	22	45.2	POT		BODY	PLAIN	SAND	WEA
144	120	1X1M	2	6	5.3	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2		38.1	POT		BODYFG	PLAIN	SAND	
144	120	1X1M	2	19	69.8	POT		BODY	CRMK	SAND	
144	120	1X1M	2	1	0.6	URM	PEBL	CRT			
144	120	1X1M	2	11	7.7	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2	21	40.2	POT		BARNES	BODY	PLAIN	SAND
144	120	1X1M	2	17	37.3	POT		BARNES	BODY	CRMK	SAND
144	120	1X1M	2	2	6.5	URM	CHNK	SS			
144	120	1X1M	2	1	1.1	CL	FLA	CRT			
144	120	1X1M	2	1	0.3	CL	FLA	CRT	HT		
144	120	1X1M	2	5	1.3	ANIM		BONE			
144	120	1X1M	2	1	2.6	POT		BASE	PLAIN	SHELL	
144	120	1X1M	2		33.4	POT		PEL			
144	120	1X1M	2		7.0	POT		DAUB			
144	120	1X1M	2	1	0.1	POT		RIM	PLAIN	SHELL	
144	120	1X1M	2	3	10.1	POT		BODY	DEC	SAND	WEA
144	120	1X1M	2	3	7.1	POT		BODY	PLAIN	SAND	
144	120	1X1M	2	1	0.4	URM	PEBL				
144	120	1X1M	2	8	29.0	POT		BODY	CRMK	SAND	
144	120	1X1M	2	6	2.9	POT		DAUB			
144	120	1X1M	2		1.0	POT		BODYFG	PLAIN	SAND	
144	120	1X1M	2	1	2.3	POT		BODY	LINPU	SORE	SAND
144	120	1X1M	2		15.0	POT		PEL			
144	120	1X1M	2	9	110.6	POT		BODY	CRMK	SAND	
144	120	1X1M	2	3	8.0	POT		BODY	DEC	SAND	WEA
144	120	1X1M	2	1	0.4	CL	SHAT	CRT			

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT	#	CT	WT						
144	120	1X1M	2	1	1.2	URM	CHNK	CRT	FC		
144	120	1X1M	2		0.8	POT		BODYFG	DEC	SAND	
144	120	1X1M	2		4.7	POT		PEL			
144	120	1X1M	2	6	87.5	POT		DAUB			
144	120	1X1M	2		1.1	POT		BODYFG	PLAIN	SAND	
144	120	1X1M	2		20.7	POT		PEL			
144	120	1X1M	2		5.0	POT		DEB			
144	120	1X1M	2	5	36.0	POT		BODY	CRMK	SAND	
144	120	1X1M	2	3	2.3	POT		BODYFG	PLAIN	SAND	
144	120	1X1M	2		0.6	POT		PEL			
144	120	1X1M	1	11	3.4	POT		PEL			
144	120	1X1M	2		4.8	FLOR		CHARC			
144	120	1X1M	2	1	0.1	CL	FLA	CRT			
144	120	1X1M	2	1	0.1	URM	PEBL				
144	120	1X1M	2	1	0.1	CL	FLA	DECORT	CRT		
144	120	1X1M	2		0.6	POT		BODYFG	DEC	SAND	
144	120	1X1M	2	1	0.2	URM	CHNK	CRT			
144	120	1X1M	2	1	18.4	POT		DAUB			
144	120	1X1M	2		5.3	POT		PEL			
144	120	1X1M	2	5	56.0	POT		BODY	CRMK	SAND	
144	120	1X1M	2	4	9.2	POT		BODY	PLAIN	SAND	
144	120	1X1M	2	1	0.3	ANIM		BONE			
144	120	1X1M	2	1	1.0	URM	PEBL				
144	120	1X1M	2	15	47.8	POT		BODY	CRMK	SAND	
144	120	1X1M	2	1	4.0	POT		BODY	LINPU	SORE	SAND
144	120	1X1M	2	1	0.8	URM	CHNK	CRT			
144	120	1X1M	2		3.3	POT		BODYFG	DEC	SAND	
144	120	1X1M	2	1	2.3	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2		5.0	POT		BODYFG	PLAIN	SAND	
144	120	1X1M	2		43.1	POT		PEL			
144	120	1X1M	2	1	8.4	POT		BODY	PLAIN	SAND	WEA
144	120	1X1M	2	1	0.5	URM	PEBL	CRT			
144	120	1X1M	2		10.5	POT		PEL			
144	120	1X1M	2		2.4	POT		DAUB			
144	120	1X1M	2	4	1.9	POT		BODYFG	SAND		
144	120	1X1M	2	1	1.1	POT		BODY	CRMK	SHELL	
145	65	CSC		1	2.4	URM	PEBL	QZIT			
145	65	CSC		1	1.5	POT		BODY	PLAIN	SHELL	
145	70	CSC		1	1.4	POT		PEL			
145	70	CSC		5	7.2	POT		BODY	CRMK	SAND	
145	70	CSC		1	0.6	POT		BODY	PLAIN	SHELL	
145	70	CSC		12	25.7	POT		BODY	PLAIN	SAND	
145	75	CSC		1	6.2	POT		BODY	DEC	SAND	WEA
145	75	CSC		1	1.2	POT		BODY	CRMK	SAND	
145	75	CSC		3	3.0	POT		PEL			
145	75	CSC		13	26.4	POT		BODY	PLAIN	SAND	
145	80	CSC		1	0.7	POT		BODYFG	PLAIN	SHELL	
145	80	CSC		5	16.4	POT		BODY	PLAIN	SAND	

TABLE C-7
3M521 ARTIFACTS

N	E	UNIT #	CT	WT						
145	80	CSC	2	5.8	POT		BODY	CRMK	SAND	
145	80	CSC		1.9	POT		BODYFG	PLAIN	SAND	
145	80	CSC		1.5	POT		PEL			
145	85	CSC	7	20.0	POT		BODY	CRMK	SAND	
145	85	CSC	7	5.5	POT		PEL			
145	85	CSC	3	1.7	POT		BODYFG	DEC	WEA	
145	85	CSC	1	5.8	POT		BASE	PLAIN	SAND	
145	85	CSC	18	33.1	POT		BODY	PLAIN	SAND	
145	90	CSC	6	13.8	POT		BODY	PLAIN	SAND	
145	90	CSC	3	12.8	POT		PEL			
145	90	CSC	9	28.0	POT		BODY	CRMK	SAND	
145	90	CSC	2	22.9	URM	PEBL				
145	100	CSC	3	3.7	POT		DAUB			
145	100	CSC	1	0.7	POT		BODY	INCI	SHELL	
145	100	CSC	1	0.3	POT		BODYFG	SHELL		
145	100	CSC	1	1.5	POT		BODY	DEC	SAND	WEA
145	100	CSC	5	7.0	POT		BODY	CRMK	SAND	
145	100	CSC	5	7.2	POT		BODY	PLAIN	SAND	
145	115	CSC	1	0.3	POT		BODYFG	SHELL		
145	115	CSC	1	2.8	POT		BODY	PLAIN	SAND	
145	115	CSC	1	1.3	POT		BODY	CRMK	SAND	
145	115	CSC	2	1.9	POT		DEB	GROG		
145	115	CSC	1	0.5	POT		BODYFG	SHELL		
145	120	CSC	5	7.1	POT		BODY	PLAIN	SAND	
150	65	CSC	5	11.9	POT		BODY	PLAIN	SAND	
150	65	CSC	1	13.9	URM	CHNK	CRT			
150	65	CSC	4	6.4	POT		BODY	PLAIN	SAND	
150	65	CSC	1	3.0	POT		BODY	CRMK	SAND	
150	70	CSC	1	3.5	POT		BODY	PLAIN	SHELL	
150	70	CSC	5	3.0	POT		PEL			
150	70	CSC	11	11.6	POT		BODY	PLAIN	SAND	
150	70	CSC	4	5.5	POT		BODY	CRMK	SAND	
150	75	CSC	2	4.5	POT		BODY	CRMK	SAND	
150	75	CSC	5	2.5	POT		PEL			
150	75	CSC	7	3.2	POT		BODYFG	PLAIN	SAND	
150	75	CSC	10	16.2	POT		BODY	PLAIN	SAND	
150	80	CSC		13.4	POT		BODYFG	PLAIN	SAND	
150	80	CSC		4.2	POT		DAUB			
150	80	CSC		3.3	POT		PEL			
150	80	CSC	6	13.5	POT		BODY	PLAIN	SAND	
150	80	CSC	9	20.6	POT		BODY	CRMK	SAND	
150	80	CSC	1	23.4	CL	BIFK	POLISH	OOL		
150	85	CSC	17	41.8	POT		BODY	PLAIN	SAND	
150	85	CSC	1	1.2	POT		RIM	PLAIN	SAND	
150	85	CSC	1	4.3	POT		RIM	CRMK	SAND	
150	85	CSC	7	18.3	POT		BODY	CRMK	SAND	
150	85	CSC	5	6.3	POT		BODY	DEC	SAND	WEA
150	85	CSC	7	5.3	POT		PEL			

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT	# CT	WT						
150	85	CSC		2.5	POT		BODYFG	SAND		
150	90	CSC	5	9.8	POT		BODY	PLAIN	SAND	
150	90	CSC	6	17.7	POT		BODY	CRMK	SAND	WEA
150	90	CSC	1	1.0	POT		BODY	PLAIN	SHELL	
150	90	CSC	1	1.3	POT		PEL			
150	90	CSC	1	1.9	POT		DAUB			
150	90	CSC	4	3.6	POT		PEL			
150	90	CSC	16	13.9	POT		BODYFG	SAND		
150	100	CSC	1	1.3	POT		DAUB			
150	100	CSC	3	1.8	POT		PEL			
150	100	CSC	1	7.5	URM	CHNK	SS			
150	100	CSC	1	0.3	CL	FLA	DECORT	CRT		
150	100	CSC		4.3	POT		BODYFG	SAND		
150	100	CSC	8	8.5	POT		BODY	CRMK	SAND	
150	100	CSC	6	2.0	POT		BODY	PLAIN	SAND	
150	100	CSC	5	9.4	POT		BODY	DEC	SAND	WEA
150	120	CSC	2	3.1	POT		BODY	PLAIN	SAND	
155	65	CSC	1	2.7	POT		BODY	PLAIN	SHELL	
155	65	CSC	1	5.5	POT		PEL			
155	65	CSC	1	1.1	POT		BODY	CRMK	SAND	
155	65	CSC	6	14.8	POT		BODY	PLAIN	SAND	
155	70	CSC	13	15.4	POT		BODY	PLAIN	SAND	
155	70	CSC	3	4.5	POT		BODY	CRMK	SAND	
155	70	CSC	1	0.4	POT		PEL			
155	75	CSC	2	2.3	POT		PEL			
155	75	CSC	1	1.5	POT		BODY	CRMK	SAND	
155	75	CSC	12	31.8	POT		BODY	PLAIN	SAND	
155	80	CSC	1	0.5	POT		BODY	DEC	SAND	WEA
155	80	CSC	2	6.6	POT		BODY	PLAIN	GROG	
155	80	CSC	14	19.1	POT		BODY	PLAIN	SAND	
155	80	CSC	2	4.1	POT		PEL			
155	85	CSC	1	2.5	POT		BODY	CRMK	SAND	
155	85	CSC	2	3.5	POT		BODY	SHELL		
155	85	CSC	5	6.6	POT		BODY	PLAIN	SAND	
155	90	CSC	4	5.7	POT		PEL			
155	90	CSC	3	3.5	POT		BODYFG	SAND		
155	90	CSC	2	4.6	POT		BODY	CRMK	SAND	
155	90	CSC	4	8.2	POT		BODY	PLAIN	SAND	
155	100	CSC		19.6	POT		BODYFG	PLAIN	SAND	
155	100	CSC	6	14.2	POT		BODY	CRMK	SAND	
155	100	CSC		4.2	POT		PEL			
155	115	CSC	1	0.3	POT		BODYFG	SAND		
155	115	CSC	1	3.4	POT		BODY	PLAIN	SAND	
155	120	CSC	1	1.9	URM	PEBL				
155	120	CSC	2	4.8	POT		BODY	SAND	WEA	
160	65	CSC	3	12.6	POT		BODY	PLAIN	SAND	
160	65	CSC	3	1.1	POT		BODYFG	SAND		
160	65	CSC	1	5.4	POT		BODY	CRMK	SAND	

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT #	CT	WT						
160	70	CSC	1	1.3	POT		BODY	CRMK	SAND	
160	70	CSC	1	4.2	POT		BODY	DEC	SAND	WEA
160	70	CSC	12	9.5	POT		BODY	PLAIN	SAND	
160	75	CSC	14	27.9	POT		BODY	PLAIN	SAND	
160	75	CSC	4	1.3	POT		PEL			
160	75	CSC	2	2.5	POT		BODY	CRMK	SAND	
160	95	CSC	1	2.8	POT		BODY	PLAIN	SAND	
160	95	CSC	7	5.9	POT		BODYFG	SAND		
160	95	CSC	2	13.7	URM	PEBL	CRT			
160	95	CSC	3	2.2	POT		BODYFG	SAND		
160	100	CSC		3.7	POT		PEL			
160	100	CSC	2	3.8	POT		BODY	CRMK	SAND	
160	100	CSC	2	3.0	POT		RIMFG	PLAIN	SAND	
160	100	CSC	1	1.9	POT		BODY	PLAIN	SHELL	
160	100	CSC	10	10.2	POT		BODYFG	PLAIN	SAND	
160	115	CSC	1	2.2	POT		DAUB			
160	115	CSC	1	3.7	POT		BODY	PLAIN	SAND	
160	115	CSC	2	2.7	POT		BODY	PLAIN	SAND	
165	65	CSC	1	2.1	POT		BODY	CRMK	SAND	
165	65	CSC	3	6.0	POT		BODY	PLAIN	SAND	
165	70	CSC	1	1.3	POT		PEL			
165	70	CSC	1	10.0	POT		BODY	CRMK	SAND	
165	70	CSC	3	5.5	POT		BODY	PLAIN	SAND	
165	75	CSC	1	6.0	POT		BODY	CRMK	SAND	
165	75	CSC	13	19.1	POT		BODY	PLAIN	SAND	
165	75	CSC	2	1.4	POT		PEL			
165	115	CSC	3	5.0	POT		BODY	CRMK	SAND	
165	115	CSC	1	2.7	POT		BODY	PLAIN	SAND	
170	65	CSC	1	3.0	POT		BODY	CRMK	SAND	
170	65	CSC	3	4.1	POT		BODY	PLAIN	SAND	
170	65	CSC	1	0.6	URM		CANC			
170	65	CSC	1	1.0	POT		BODY	PLAIN	SHELL	
170	70	CSC	1	1.0	POT		BODY	PLAIN	SAND	
170	70	CSC	1	2.4	POT		BODY	DEC	SAND	WEA
170	75	CSC	2	4.0	POT		BODY	PLAIN	SAND	
170	95	CSC	9	6.4	POT		BODYFG	SAND		
170	95	CSC	2	2.4	POT		PEL			
170	95	CSC	3	3.7	POT		BODY	PLAIN	SAND	
170	95	CSC	2	2.2	POT		BODY	PLAIN	SAND	
170	95	CSC	1	1.3	POT		BODY	CRMK	SAND	
170	95	CSC	1	1.2	POT		BODY	PLAIN	SHELL	
170	115	CSC	1	1.0	POT		BODY	PLAIN	SAND	
170	115	CSC	1	3.5	POT		BODY	PLAIN	SAND	
175	65	CSC	1	0.9	POT		BODY	PLAIN	SHELL	
175	65	CSC	1	0.9	POT		BODY	PLAIN	SAND	
175	70	CSC	1	2.1	POT		BODY	SHELL	WEA	
175	70	CSC	1	1.2	POT		BODY	PLAIN	SAND	
175	95	CSC	1	2.6	POT		BODY	CRMK	SAND	

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT #	CT	WT						
175	95	CSC	1	3.0	POT		RIM	PLAIN	SAND	
175	95	CSC	2	1.7	POT		BODY	DEC	SAND	WEA
175	95	CSC	10	12.1	POT		BODY	PLAIN	SAND	
175	115	CSC	1	1.0	POT		RIMFG	PLAIN	SAND	
180	70	CSC	3	3.2	POT		BODY	SAND	WEA	
180	95	CSC	2	2.9	POT		BODY	DEC	SAND	WEA
180	95	CSC	1	2.0	POT		BODY	CRMK	SAND	
180	95	CSC	1	3.5	POT		DAUB			
180	95	CSC	2	1.2	POT		PEL			
180	95	CSC	3	3.3	POT		BODY	SAND	WEA	
185	95	CSC	1	0.7	POT		BODY	SHELL	WEA	
185	95	CSC	3	5.8	POT		DAUB			
185	95	CSC	1	1.1	POT		BODY	SAND	WEA	
190	95	CSC	1	4.5	URM	CHNK	CRT			
190	95	CSC	2	0.8	POT		BODYFG	SAND		
195	95	CSC	1	0.3	POT		BODYFG	SAND		
195	95	CSC	1	1.3	POT		BODY	DEC	SAND	WEA
195	115	CSC	1	0.6	POT		BODYFG	PLAIN	SAND	
195	120	CSC	1	1.5	POT		BODY	CRMK	SAND	
195	120	CSC	1	1.4	POT		BODY	SAND	WEA	
200	115	CSC		0.7	POT		PEL			
200	115	CSC	3	5.6	POT		BODY	PLAIN	SAND	
200	115	CSC	1	56.5	URM		SS			
200	120	CSC	4	7.3	POT		BODY	PLAIN	SAND	
200	120	CSC	1	2.7	POT		BODY	DEC	SAND	WEA
200	120	CSC	1	1.9	POT		PEL			
200	120	CSC	1	3.5	POT		RIM	PLAIN	SAND	
200	120	CSC	3	6.3	POT		BODY	CRMK	SAND	
205	95	CSC	4	3.8	POT		BODY	PLAIN	SAND	
205	115	CSC	2	2.4	POT		BODYFG	PLAIN	SAND	
205	120	CSC	3	4.7	POT		BODY	SHELL		
205	120	CSC	1	0.5	POT		PEL			
205	120	CSC	1	0.2	URM	PEBL				
205	120	CSC	9	5.8	POT		BODY	SAND	WEA	
205	120	CSC	1	1.8	POT		BODY	CRMK	SAND	
210	95	CSC	2	0.4	POT		BODYFG	SAND		
210	95	CSC	2	1.8	POT		BODY	PLAIN	SAND	
210	115	CSC	1	6.6	POT		PPO			
210	120	CSC	1	1.3	POT		PEL			
210	120	CSC	3	3.4	POT		BODY	PLAIN	SAND	
210	120	CSC	2	9.4	POT		BODY	CRMK	SAND	
215	120	CSC	1	0.8	POT		PEL			
215	120	CSC	1	0.1	POT		BODYFG	SAND		
		GENE	1	0.9	URM		CANC			
		GENE	1	1.3	CL	FLA	CRT			
		GENE	1	0.5	METAL		FERS	METOBJ		
		GENE	1	1.7	FOSSI		IND			
		GENE	1	4.4	POT		RIM	CRMK	SAND	WEA

TABLE C-7
3MS21 ARTIFACTS

N	E	UNIT #	CT	WT						
		GENE	3	14.0	POT		BODY	CRMK	SAND	
		GENE	1	2.3	POT		BODY	PLAIN	SHELL	
		GENE	11	16.6	POT		BODY	PLAIN	SAND	
		GENE	1	19.7	GLASS		BBASE	DBRN	MOLD	
		GENE	1	1.0	POT		BODY	DEC	SAND	WEA
		GENE	1	11.2	URM	PEBL				
		GENE	1	2.7	METAL		COPPER	COIN		
		GENE	1	125.6	GRL		HAM	QZIT		
		GENE	1	7.4	GLASS		CURVE	CLEAR		
		GENE	1	24.3	GLASS		LGRN	MELT		
		GENE	2	4.5	POT		BODY	CRMK	SAND	
		GENE	1	3.4	EARTH		WHITE	MOLD		
		GENE	3	8.0	POT		BODY	CRMK	SAND	
		GENE	1	4.1	POT		RIM	CRMK	SAND	
		GENE	14	52.5	POT		BODY	CRMK	SAND	
		GENE	5	8.5	POT		BODY	PLAIN	SAND	
		GENE	1	4.2	POT		RIM	CRMK	SAND	WEA
		GENE	3	3.3	POT		BODY	PLAIN	SAND	
		GENE	2	10.0	POT		BODY	CRMK	SAND	
		GENE	1	6.5	POT		RIM	CRMK	SAND	
		GENE	1	3.3	POT		RIM	PLAIN	SAND	
		GENE	1	0.1	CL	FLA	CRT			
		GENE	1	1.6	URM	PEBL				
		GENE	1	2.0	CL	FLA	CRT	HT		
		GENE	1	4.8	URM	CHNK	CRT	FC		
		GENE	1	0.8	ANIM		BONE			
		GENE	1	5.0	POT		BODY	DEC	SAND	WEA
		GENE	7	14.9	POT		BODY	PLAIN	SAND	
		GENE	1	9.1	POT		PEL			
		GENE	2	13.2	POT		DAUB			

Number of artifacts in printout: 558
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 3:38

TABLE C-8 3MS21 ARTIFACTS FROM TEST UNIT BY DEPTH

MINARK D.B.S. V4.2

Database name: ARTFORM
This retrieval performed: 22Sep86 0:55
Data last updated: 22Sep86 0:2
Total artifacts in database with data: 3614
# of artifacts excluded by security rating: 0

Subset name: 3MS21B # of artifacts in subset: 164

Cumulative selection criteria:
SNO = 3MS21 :
UNIT = 1X1M :

All artifacts selected

—) BDEPTH = 10

144	94	1X1M	1	0.00	10.00	1	1.8	CL	FLA	CRT			
144	94	1X1M	1	0.00	10.00	1	0.5	POT		BODY	PLAIN	SHELL	
144	94	1X1M	1	0.00	10.00	1	1.5	POT		BODY	PLAIN	SHELL	
144	94	1X1M	1	0.00	10.00	1	1.7	POT		BODY	FINS	SAND	
144	94	1X1M	1	0.00	10.00	2	0.8	POT		BODY	PLAIN	SHELL	
144	94	1X1M	1	0.00	10.00	1	0.3	POT		RIMFG	PLAIN	SAND	
144	94	1X1M	1	0.00	10.00	13	20.4	POT		BODY	PLAIN	SAND	
144	94	1X1M	1	0.00	10.00		36.7	POT		BODYFG	SAND		
144	120	1X1M	1	0.00	10.00	11	3.4	POT		PEL			
144	94	1X1M	1	0.00	10.00	7	20.7	POT		DAUB			
144	94	1X1M	1	0.00	10.00		3.4	POT		PEL			
144	94	1X1M	1	0.00	10.00	17	39.4	POT		BODY	CRMK	SAND	
144	94	1X1M	1	0.00	10.00	1	0.4	URM	PEBL	CRT			
144	94	1X1M	1	0.00	10.00	4	1.5	URM		CANC			

CT 60.00 5.000 60.00
WT 132.50 9.464 132.50

—) BDEPTH = 20

144	94	1X1M	1	10.00	20.00	1	0.1	FLOR		CHARC			
144	94	1X1M	1	10.00	20.00	3	6.2	POT		BODY	PLAIN	SHELL	
144	94	1X1M	1	10.00	20.00		39.8	POT		PEL			
144	94	1X1M	1	10.00	20.00	1	2.0	POT		BODY	RED	SHELL	
144	94	1X1M	1	10.00	20.00	22	61.4	POT		BODY	CRMK	SAND	
144	94	1X1M	1	10.00	20.00	10	21.2	POT		BODY	PLAIN	SAND	WEA
144	94	1X1M	1	10.00	20.00		74.0	POT		BODYFG	PLAIN	SAND	WEA
144	94	1X1M	1	10.00	20.00	3	2.8	URM	CHNK	CRT			

TABLE C-8 3MS21 ARTIFACTS FROM TEST UNIT BY DEPTH

N	E	UNIT	#	TOP	BOTTM	CT	WT					

CT	40.00	6.667	100.00
WT	207.50	25.937	340.00

—) BDEPTH = 30

N	E	UNIT	#	TOP	BOTTM	CT	WT					
144	94	1X1M	1	20.00	30.00	1	0.1	FLOR		CHARC		
144	94	1X1M	1	20.00	30.00		25.6	POT		BODYFG	PLAIN	SAND
144	94	1X1M	1	20.00	30.00		18.4	POT		PEL		
144	94	1X1M	1	20.00	30.00	22	123.1	POT		BODY	CRMK	SAND
144	94	1X1M	1	20.00	30.00	29	24.5	POT		DAUB		
144	94	1X1M	1	20.00	30.00	1	3.4	POT		RIM	CRMK	SAND
144	94	1X1M	1	20.00	30.00	10	28.6	POT		BODY	PLAIN	SAND
144	94	1X1M	1	20.00	30.00		14.3	POT		BODYFG	DEC	SAND
144	94	1X1M	1	20.00	30.00	18	72.1	POT		BODY	DEC	SAND	WEA
144	94	1X1M	1	20.00	30.00	1	0.2	URM	CHNK	CRT		
144	94	1X1M	1	20.00	30.00	1	0.6	URM	PEBL			
144	94	1X1M	1	20.00	30.00		0.6	METAL		FERS		

CT	83.00	10.375	183.00
WT	311.50	25.958	651.50

—) BDEPTH = 40

N	E	UNIT	#	TOP	BOTTM	CT	WT					
144	94	1X1M	1	30.00	40.00		2.7	POT		PEL		
144	94	1X1M	1	30.00	40.00	2	3.8	POT		DAUB		
144	94	1X1M	1	30.00	40.00	1	2.0	POT		BODY	FING	SAND
144	94	1X1M	1	30.00	40.00	2	1.9	POT		BODY	PLAIN	SAND
144	94	1X1M	1	30.00	40.00	2	2.7	POT		BODY	SAND	WEA
144	94	1X1M	1	30.00	40.00	9	29.2	POT		BODY	CRMK	SAND
144	94	1X1M	1	30.00	40.00	1	0.2	URM	PEBL			

CT	17.[illegible]	2.833	200.00
WT	42.[illegible]	6.071	694.00

—) BDEPTH = 50

N	E	UNIT	#	TOP	BOTTM	CT	WT					
144	94	1X1M	1	40.00	50.00	1	1.0	CL	BIFK	PPK	CRT	DS
144	94	1X1M	1	40.00	50.00	1	8.2	POT		RIM	CRMK	SAND
144	94	1X1M	1	40.00	50.00	3	2.4	POT		BODY	CRMK	SAND
144	94	1X1M	1	40.00	50.00	5	32.1	POT		DAUB		
144	94	1X1M	1	40.00	50.00		0.6	POT		BODYFG	SAND	
144	94	1X1M	1	40.00	50.00	2	5.6	POT		BODY	PLAIN	SAND

CT	12.00	2.400	212.00
WT	49.90	8.317	743.90

—) BDEPTH = 60

N	E	UNIT	#	TOP	BOTTM	CT	WT					
144	94	1X1M	1	50.00	60.00	3	5.6	POT		PEL		
144	94	1X1M	1	50.00	60.00	1	4.2	POT		PPO	FR	

TABLE C-8 3MS21 ARTIFACTS FROM TEST UNIT BY DEPTH

N	E	UNIT	#	TOP	BOTTM	CT	WT						
144	94	1X1M	1	50.00	60.00	1	4.8	POT		BODY	DEC	SAND	WEA
144	94	1X1M	1	50.00	60.00	1	21.7	POT		PPO			
144	94	1X1M	1	50.00	60.00	1	6.6	POT		BODY	PLAIN	SAND	
144	94	1X1M	1	50.00	60.00	4	9.4	POT		BODY	PLAIN	SAND	

CT	11.00	1.833	223.00
WT	52.30	8.717	796.20

—) BDEPTH = 85

N	E	UNIT	#	TOP	BOTTM	CT	WT					
144	94	1X1M	1	72.00	85.00	2	24.4	POT		BODY	CRMK	SAND

CT	2.00	2.000	225.00
WT	24.40	24.400	820.60

—) BDEPTH = 9

N	E	UNIT	#	TOP	BOTTM	CT	WT					
144	120	1X1M	2	0.00	9.00	11	9.4	POT		BODY	PLAIN	SAND
144	120	1X1M	2	0.00	9.00	4	6.3	POT		BODY	CRMK	SAND
144	120	1X1M	2	0.00	9.00	8	2.2	POT		BODYFG	GRCG	
144	120	1X1M	2	0.00	9.00		6.3	POT		BODYFG	SAND	
144	120	1X1M	2	0.00	9.00	10	4.3	POT		PEL		
144	120	1X1M	2	0.00	9.00	1	0.6	URM	PEBL	CRT		
144	120	1X1M	2	0.00	9.00	1	1.9	METAL		TIN	METOBJ	

CT	35.00	5.833	260.00
WT	31.00	4.429	851.60

—) BDEPTH = 24

N	E	UNIT	#	TOP	BOTTM	CT	WT						
144	120	1X1M	2	9.00	24.00	1	1.1	CL	FLA	CRT			
144	120	1X1M	2	9.00	24.00	1	4.6	POT		RIM	PLAIN	SAND	
144	120	1X1M	2	9.00	24.00	17	37.3	POT		BARNES	BODY	CRMK	SAND
144	120	1X1M	2	9.00	24.00		7.0	POT		DAUB			
144	120	1X1M	2	9.00	24.00	1	0.1	POT		RIM	PLAIN	SHELL	
144	120	1X1M	2	9.00	24.00	6	5.3	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2	9.00	24.00		38.1	POT		BODYFG	PLAIN	SAND	
144	120	1X1M	2	9.00	24.00		33.4	POT		PEL			
144	120	1X1M	2	9.00	24.00	21	40.2	POT		BARNES	BODY	PLAIN	SAND
144	120	1X1M	2	9.00	24.00	1	2.6	POT		BASE	PLAIN	SHELL	
144	120	1X1M	2	9.00	24.00	2	1.3	URM	CHNK	CRT	FC		
144	120	1X1M	2	9.00	24.00	2	6.5	URM	CHNK	SS			

CT	52.00	5.778	312.00
WT	177.50	14.792	1029.10

—) BDEPTH = 35

N	E	UNIT	#	TOP	BOTTM	CT	WT				
144	120	1X1M	2	24.00	35.00	5	1.3	ANIM		BONE	
144	120	1X1M	2	24.00	35.00	1	0.3	CL	FLA	CRT	HT

TABLE C-8 3MS21 ARTIFACTS FROM TEST UNIT BY DEPTH

N	E	UNIT	#	TOP	BOTTM	CT	WT						
144	120	1X1M	2	24.00	35.00	1	0.5	CL	FLA	CRT			
144	120	1X1M	2	24.00	35.00	1	1.6	CL	FLA	DECORT	CRT		
144	120	1X1M	2	24.00	35.00	31	105.5	POT		BODY	PLAIN	SAND	
144	120	1X1M	2	24.00	35.00		76.7	POT		PEL			
144	120	1X1M	2	24.00	35.00	27	107.6	POT		BODY	CRMK	SAND	
144	120	1X1M	2	24.00	35.00	1	3.7	POT		BODY	FING	SAND	
144	120	1X1M	2	24.00	35.00	10	40.4	POT		DAUB			
144	120	1X1M	2	24.00	35.00	16	11.6	POT		BODYFG	PLAIN	SHELL	
144	120	1X1M	2	24.00	35.00	2	2.8	POT		BODY	PLAIN	SHELSA	
144	120	1X1M	2	24.00	35.00	2	9.0	POT		BODY	RED	SHELSA	
144	120	1X1M	2	24.00	35.00	2	2.2	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2	24.00	35.00	6	1.7	POT		BODYFG	PLAIN	SHELL	
144	120	1X1M	2	24.00	35.00	5	0.4	POT		BODYFS	PLAIN	SHELSA	
144	120	1X1M	2	24.00	35.00	4	1.5	URM	PEBL				

CT	116.00	7.733	428.00
WT	367.60	22.987	1396.90

—) BDEPTH = 45

144	120	1X1M	2	35.00	45.00	2	0.7	ANIM					
144	120	1X1M	2	35.00	45.00	2	0.8	CL	FLA	CRT			
144	120	1X1M	2	35.00	45.00		48.8	POT		PEL			
144	120	1X1M	2	35.00	45.00	11	7.7	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2	35.00	45.00	22	45.2	POT		BODY	PLAIN	SAND	WEA
144	120	1X1M	2	35.00	45.00	19	69.8	POT		BODY	CRMK	SAND	
144	120	1X1M	2	35.00	45.00		2.2	POT		DAUB			
144	120	1X1M	2	35.00	45.00		49.0	POT		BODYFS	PLAIN	SAND	
144	120	1X1M	2	35.00	45.00	2	1.2	URM	SHAT				

CT	58.00	9.667	466.00
WT	225.40	25.244	1622.30

—) BDEPTH = 55

144	120	1X1M	2	45.00	55.00	1	0.8	CL	FLA	CRT			
144	120	1X1M	2	45.00	55.00	2	29.6	POT		RIM	CRMK	SAND	
144	120	1X1M	2	45.00	55.00	8	23.4	POT		BODY	PLAIN	SAND	
144	120	1X1M	2	45.00	55.00	5	23.6	POT		BODY	DEC	SAND	WEA
144	120	1X1M	2	45.00	55.00	27	164.0	POT		BODY	CRMK	SAND	
144	120	1X1M	2	45.00	55.00	2	17.6	POT		BODY	CRMK	SAND	
144	120	1X1M	2	45.00	55.00	3	4.2	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2	45.00	55.00	1	15.1	POT		BODY	DEC	GROS	
144	120	1X1M	2	45.00	55.00	2	3.5	POT		BODY	PLAIN	SHELL	
144	120	1X1M	2	45.00	55.00		51.2	POT		PEL			
144	120	1X1M	2	45.00	55.00	1	3.2	POT		RIM	PLAIN	SHELSA	
144	120	1X1M	2	45.00	55.00	2	2.9	POT		BODYFS	DEC	SAND	
144	120	1X1M	2	45.00	55.00		15.0	POT		PEL			
144	120	1X1M	2	45.00	55.00		33.9	POT		BODYFS	SAND		
144	120	1X1M	2	45.00	55.00		1.3	POT		BODYFG	SHELL		
144	120	1X1M	2	45.00	55.00	2	1.9	URM	CHNK	CRT	FC		

TABLE C-8 3MS21 ARTIFACTS FROM TEST UNIT BY DEPTH

__N__E__UNIT_#__TOP__BOTTM__CT__WT__

CT	56.00	4.667	542.00
WT	391.20	24.450	2013.50

—) BDEPTH = 65

144	120	1X1M	2	55.00	65.00	1	0.3	ANIM		BONE				
144	120	1X1M	2	55.00	65.00		3.3	POT		BODYFG	DEC	SAND		
144	120	1X1M	2	55.00	65.00	1	2.3	POT		BODY	PLAIN	SHELL		
144	120	1X1M	2	55.00	65.00		6.0	POT		BODYFG	PLAIN	SAND		
144	120	1X1M	2	55.00	65.00		43.1	POT		PEL				
144	120	1X1M	2	55.00	65.00	13	7.3	POT		BODY	CRMK	SAND		
144	120	1X1M	2	55.00	65.00	2	60.8	POT		RIM	CRMK	SAND		
144	120	1X1M	2	55.00	65.00	1	2.9	POT		BODY	SAND	WEA		
144	120	1X1M	2	55.00	65.00	1	0.3	URM	CHNK	CRT				
144	120	1X1M	2	55.00	65.00	1	1.0	URM	PEBL					

CT	20.00	2.857	562.00
WT	127.80	12.780	214..30

—) BDEPTH = 75

144	120	1X1M	2	65.00	75.00	1	0.4	CL	SHAT	CRT				
144	120	1X1M	2	65.00	75.00	4	1.9	POT		BODYFG	SAND			
144	120	1X1M	2	65.00	75.00		2.4	POT		DAUB				
144	120	1X1M	2	65.00	75.00		10.5	POT		PEL				
144	120	1X1M	2	65.00	75.00	1	1.1	POT		BODY	CRMK	SHELL		
144	120	1X1M	2	65.00	75.00	1	4.0	POT		BODY	LINPU	SORE	SAND	
144	120	1X1M	2	65.00	75.00	15	47.8	POT		BODY	CRMK	SAND		
144	120	1X1M	2	65.00	75.00	1	8.4	POT		BODY	PLAIN	SAND	WEA	
144	120	1X1M	2	65.00	75.00	1	1.2	URM	CHNK	CRT	FC			
144	120	1X1M	2	65.00	75.00	1	0.5	URM	PEBL	CRT				

CT	25.00	3.125	587.00
WT	78.20	7.820	2219.50

—) BDEPTH = 85

144	120	1X1M	2	75.00	85.00		1.1	POT		BODYFG	PLAIN	SAND		
144	120	1X1M	2	75.00	85.00		0.8	POT		BODYFG	DEC	SAND		
144	120	1X1M	2	75.00	85.00		4.7	POT		PEL				
144	120	1X1M	2	75.00	85.00	9	110.6	POT		BODY	CRMK	SAND		
144	120	1X1M	2	75.00	85.00	3	8.0	POT		BODY	DEC	SAND	WEA	
144	120	1X1M	2	75.00	85.00	6	87.5	POT		DAUB				
144	120	1X1M	2	75.00	85.00	1	0.4	URM	PEBL					

CT	19.00	4.750	606.00
WT	213.10	30.443	2432.60

TABLE C-8 3MS21 ARTIFACTS FROM TEST UNIT BY DEPTH

N	E	UNIT	#	TOP	BOTTM	CT	WT						
144	120	1X1M	2	85.00	95.00	1	0.1	CL	FLA	DECORT	CRT		
144	120	1X1M	2	85.00	95.00		15.0	POT		PEL			
144	120	1X1M	2	85.00	95.00		1.0	POT		BODYFS	PLAIN	SAND	
144	120	1X1M	2	85.00	95.00	6	2.9	POT		DAUB			
144	120	1X1M	2	85.00	95.00	3	10.1	POT		BODY	DEC	SAND	WEA
144	120	1X1M	2	85.00	95.00	8	29.0	POT		BODY	CRMK	SAND	
144	120	1X1M	2	85.00	95.00	1	2.3	POT		BODY	LINPJ	SORE	SAND
144	120	1X1M	2	85.00	95.00	3	7.1	POT		BODY	PLAIN	SAND	
144	120	1X1M	2	85.00	95.00		0.6	POT		BODYFS	DEC	SAND	
144	120	1X1M	2	85.00	95.00	1	0.1	URM	PEBL				
144	120	1X1M	2	85.00	95.00	1	0.2	URM	CHNK	CRT			

CT	24.00	3.000	630.00
WT	68.40	6.218	2501.00

—) BDEPTH = 105

144	120	1X1M	2	95.00	105.00	1	18.4	POT		DAUB		
144	120	1X1M	2	95.00	105.00		5.3	POT		PEL		
144	120	1X1M	2	95.00	105.00	5	56.0	POT		BODY	CRMK	SAND
144	120	1X1M	2	95.00	105.00	4	9.2	POT		BODY	PLAIN	SAND

CT	10.00	3.333	640.00
WT	88.90	22.225	2589.90

—) BDEPTH = 115

144	120	1X1M	2	105.00	115.00	1	0.1	CL	FLA	CRT		
144	120	1X1M	2	105.00	115.00		4.8	FLOR		CHARC		
144	120	1X1M	2	105.00	115.00		5.0	POT		DEB		
144	120	1X1M	2	105.00	115.00	5	35.0	POT		BODY	CRMK	SAND
144	120	1X1M	2	105.00	115.00	3	0.3	POT		BODYFS	PLAIN	SAND
144	120	1X1M	2	105.00	115.00		20.7	POT		PEL		

CT	9.00	3.000	649.00
WT	66.90	11.150	2655.80

—) BDEPTH = 125

144	120	1X1M	2	115.00	125.00	1	10.8	POT		BODY	CRMK	SAND
144	120	1X1M	2	115.00	125.00		0.6	POT		PEL		

TABLE C-9
3MS477 ARTIFACTS

N	E	UNIT #	CT	WT						
0	0		5	6.4	POT		BODY	PLAIN	SAND	
0	0		1	1.2	POT		BODY	DEC	SAND	WEA
0	0		2	3.3	POT		BODY	CRMK	SAND	
0	0		3	1.4	POT		BODYFG	PLAIN	SAND	
0	10		1	2.6	POT		PEL			
15	8		1	0.6	POT		BODY	PLAIN	SAND	
19	5		1	1.3	POT		BODY	PLAIN	SAND	
29	6		1	0.9	POT		BODY	PLAIN	SAND	
32	6		1	0.9	POT		BODY	PLAIN	SAND	
33	8		1	1.8	POT		BODY			
34	12		1	0.6	POT		BODY	PLAIN	GROSAN	
36	6		1	0.6	POT		BODY	PLAIN	GROSAN	
36	12		1	2.2	POT		BODY	PLAIN	SAND	
37	16		1	0.9	POT		BODY	PLAIN	SAND	
41	8		1	1.5	POT		BODY	PLAIN	SAND	
41	20		1	1.6	POT		BODY	PLAIN	SAND	
50	17		1	0.2	POT		BODY	PLAIN	SAND	
56	11		1	1.5	POT		BODY	PLAIN	SAND	
57	15		1	0.8	POT		BODY	PLAIN	GROS	
58	19		1	0.6	POT		BODY	PLAIN	SAND	
			1	5.9	CL	BIFK	CRT	FR		
			1	0.8	URM	PEBL				

Number of artifacts in printout: 22
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 3:38

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT						
60	95	CSC	1	2.6	GLASS		CURVE	CLEAR		
60	95	CSC	1	2.3	GLASS		CURVE	BROWN		
60	95	CSC	1	22.0	METAL		FERS	METOBJ		
60	95	CSC	1	29.6	URM	PEBL	GRAD			
60	100	CSC	3	5.1	GLASS		CURVE	CLEAR	MOLD	
60	100	CSC	1	1.1	GLASS		CURVE	CLEAR		
60	100	CSC	1	4.3	METAL		FERS	METOBJ		
60	100		1	2.6	URM	CHNK				
60	100		1	0.5	ANIM		BONE			
60	105	CSC	1	25.1	GLASS		CURVE	CLEAR		
60	105	CSC	2	4.2	GLASS		CURVE	BROWN	MOLD	
60	105	CSC	2	96.7	URM	COBL	CRT			
65	95	CSC	1	0.6	EARTH		WHITE	RIM	SILT	
65	95	CSC	2	3.6	GLASS		CURVE	MOLD	CLEAR	
65	95	CSC	1	4.7	GLASS		CURVE	BROWN	MOLD	
65	95	CSC	3	2.5	METAL		FERS	METOBJ		
65	100		3	56.6	URM	CHNK	CRT			
65	100	CSC	5	6.4	METAL		METOBJ			
65	100		1	0.4	POT		BODYFS	SAND		
65	100	CSC	1	0.6	GLASS		FLAT	CLEAR	MOLD	
65	100	CSC	1	2.1	GLASS		CURVE	CLEAR	MOLD	
65	100	CSC	1	3.1	GLASS		CURVE	BLUE	EMBOSS	
65	100	CSC	1	3.7	GLASS		JRIM	CLEAR	MOLD	
65	100	CSC	1	8.5	GLASS		BASE	BROWN		
65	100	CSC	1	2.0	GLASS		CURVE	CLEAR		
65	100	CSC	1	20.9	GLASS		BBASE	MARPAR	SBASAL	
65	100	CSC	1	8.6	GLASS		SQBASE	CLEAR	RSB	EMBOSS
65	105	CSC	1	11.1	GLASS		BASE	CLEAR		
65	105	CSC	7	15.4	GLASS		CURVE	CLEAR		
65	105	CSC	2	4.6	GLASS		CURVE	CLEAR	MOLD	
65	105	CSC	1	15.6	METAL		FERS	NAIL		
65	105	CSC	3	1.6	METAL		FERS	METOBJ		
65	105	CSC	1	0.5	OHIST		IND			
70	95	CSC	5	11.7	GLASS		CURVE	CLEAR		
70	95	CSC	1	0.8	GLASS		FLAT	CLEAR		
70	95	CSC	2	2.4	FOSSI					
70	95	CSC	1	4.8	URM		CRT			
70	100		4	21.1	URM	PEBL				
70	100	CSC	8	10.9	METAL		FERS			
70	100	CSC	1	103.5	METAL		UJOINT			
70	100	CSC	1	6.6	METAL		NAIL	COMMON		
70	100	CSC	1	67.0	OHIST		CNCRETE			
70	100		1	2.6	URM		CANC			
70	100	CSC	1	1.0	GLASS		FLAT	CLEAR		
70	100	CSC	1	0.5	GLASS		FLAT	CLEAR	MOLD	
70	100	CSC	3	7.5	GLASS		CURVE	CLEAR	MOLD	
70	100	CSC	3	2.8	GLASS		CURVE	CLEAR		
70	100	CSC	1	0.2	GLASS		FLAT	BLUE		

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT							
70	100	CSC	1	3.3	GLASS		CURVE	BLUE			
70	100	CSC	1	2.1	GLASS		CURVE	BROWN	MOLD		
70	100	CSC	1	18.3	GLASS		BASE	CLEAR	EMBOSS	MOLD	
70	105	CSC	1	9.6	GLASS		CURVE	CLEAR	MOLD		
70	105	CSC	1	1.6	GLASS		CURVE	CLEAR			
70	105	CSC	2	6.1	METAL		FERS	METOBJ			
70	105	CSC	1	240.7	URM	CONC					
75	95	CSC	9	14.5	GLASS		CURVE	CLEAR			
75	95	CSC	3	7.1	GLASS		FLAT	CLEAR			
75	95	CSC	1	1.8	GLASS		CURVE	BROWN			
75	95	CSC	3	18.3	METAL		METOBJ				
75	95	CSC	2	35.3	METAL		WIRE				
75	100		1	82.7	URM	PEBL	QZIT				
75	100		1	15.0	CL	PEBL	TESTED	CRT			
75	100	CSC	1	2.2	GLASS		CURVE	BROWN			
75	100	CSC	1	3.7	GLASS		CURVE	BROWN	MOLD		
75	100	CSC	6	6.7	METAL		FERS				
75	100	CSC	1	0.6	METAL		WIRE				
75	100	CSC	4	6.4	GLASS		FLAT	CLEAR			
75	100	CSC	5	8.0	GLASS		CURVE	CLEAR			
75	100	CSC	1	7.3	GLASS		JRIM	MOLD	CLEAR		
75	100	CSC	1	52.6	GLASS		BBASE	CLEAR	EMBOSS	MARPAR	SBASAL
80	95	CSC	4	18.2	GLASS		CURVE	CLEAR			
80	95	CSC	1	4.9	GLASS		BNECK	CLEAR	PAINT		
80	95	CSC	2	4.0	GLASS		CURVE	BROWN			
80	95	CSC	11	14.5	METAL		METOBJ				
80	95	CSC	1	4.4	METAL		STAPLE				
80	95	CSC	1	0.9	METAL		WIRE				
80	95	CSC	1	5.2	OHIST		GRAPH	BATCOR			
80	95	CSC	1	3.0	URM		CRT				
80	100		1	0.2	URM	PEBL					
80	100	CSC	1	1.2	METAL		FERS				
80	100	CSC	1	0.1	SYN		PLAST				
80	100	CSC	2	3.4	GLASS		CURVE	CLEAR	MOLD		
80	100	CSC	1	4.1	GLASS		SBASE	CLEAR	RSB		
80	100	CSC	3	3.7	GLASS		CURVE	CLEAR			
80	100	CSC	1	2.0	GLASS		CURVE	CLEAR	EMBOSS	MOLD	
80	100	CSC	1	10.2	GLASS		CURVE	LGRN	MOLD		
80	105	CSC	11	27.2	GLASS		CURVE	CLEAR			
80	105	CSC	3	2.4	GLASS		FLAT	CLEAR			
80	105	CSC	1	30.0	GLASS		BNECK	CLEAR	SLIP	CROWN	
80	105	CSC	1	14.4	GLASS		CURVE	LGRN			
80	105	CSC	2	0.9	GLASS		MILK				
80	105	CSC	7	5.4	METAL		FERS	METOBJ			
80	105	CSC	2	15.4	METAL		NAIL				
85	95	CSC	2	26.7	GLASS		SQUARE	CLEAR			
85	95	CSC	1	1.[illegible]	GLASS		CURVE	LBLUE			
85	95	CSC	4	5.5	METAL		METOBJ				

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT					
85	95	CSC	1	1.6	FOSSI		IND		
85	95	CSC	1	1.6	SYN		PLAST	TOY	
85	100	CSC	1	2.0	GLASS		CURVE	MILK	
85	100	CSC	1	2.8	GLASS		CURVE	CLEAR	MOLD
85	100	CSC	1	0.4	GLASS		FLAT	CLEAR	
85	100	CSC	4	5.8	GLASS		CURVE	CLEAR	
85	100	CSC	1	1.4	GLASS		CURVE	LBLUE	
85	100	CSC	1	1.2	GLASS		BBASE	LGRN	
85	100	CSC	2	2.9	GLASS		CURVE	BROWN	
85	100	CSC	9	7.8	METAL		FERS		
85	100	CSC	1	5.5	FOSSI		SHING		
85	100		1	0.3	URM		CANC		
85	100		2	5.6	URM		LS		
85	100		3	4.7	URM		CRT		
85	105	CSC	1	3.6	EARTH		WHITE	RIM	DECAL
85	105	CSC	1	1.4	EARTH		WHITE	BODY	MONCG
85	105	CSC	1	7.0	GLASS		BASE	CLEAR	RSB
85	105	CSC	2	8.4	GLASS		MLID	MILK	
85	105	CSC	5	13.0	GLASS		CURVE	BROWN	
85	105	CSC	4	16.4	GLASS		CURVE	GREEN	
85	105	CSC	15	30.0	GLASS		CURVE	CLEAR	
85	105	CSC		9.8	METAL		FERS	METOBJ	
85	105	CSC	1	0.5	FOSSI		IND		
85	105	CSC	1	8.0	GLASS		TABLE	LGRN	PRESS
90	95	CSC	1	0.7	GLASS		CURVE	CLEAR	
90	95	CSC	2	4.0	GLASS		FLAT	CLEAR	
90	95	CSC	1	1.2	GLASS		CURVE	CLEAR	MOLD
90	95	CSC	1	3.9	GLASS		JRIM	CLEAR	
90	95	CSC	2	3.5	GLASS		CURVE	BROWN	MOLD
90	95	CSC	1	1.0	EARTH		WHITE		
90	95	CSC	1	0.7	EARTH		GLAZE	YELLOW	
90	95	CSC	2	14.6	METAL		NAIL		
90	95	CSC	1	6.2	METAL		STAPLE		
90	95	CSC	2	1.1	METAL		METOBJ		
90	95	CSC	1	1.0	URM		CRT		
90	100	CSC	1	1.0	GLASS		FLAT	CLEAR	
90	100	CSC	1	3.7	GLASS		CURVE	CLEAR	
90	100	CSC	1	1.2	PORCE		FIG	WHITE	UNDEC
90	100	CSC	5	3.8	METAL		METOBJ		
90	100	CSC	1	33.2	BRICK				
90	100		1	36.5	CL	PEBL	TESTED	CRT	
90	105	CSC	1	0.3	GLASS		CURVE	CLEAR	
90	105	CSC	2	19.3	GLASS		FLAT	CLEAR	
90	105		1	1.0	CL	SHAT	CRT		
90	105		1	1.8	URM	PEBL	CRT		
90	105	CSC	12	6.5	METAL		FERS	METOBJ	
90	105	CSC	1	536.3	METAL		AXHEAD		
90	105	CSC	1	1.5	METAL		WIRE		

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT					
95	95	CSC	1	15.7	BRICK				
95	95		1	5.2	URM PEBL				
95	95	CSC	1	13.4	GLASS	CURVE	CLEAR	MOLD	
95	95	CSC	1	1.0	GLASS	CURVE	BROWN	MOLD	
95	95	CSC	1	1.6	GLASS	CURVE	LBRN		
95	95	CSC	6	5.3	GLASS	CURVE	CLEAR		
95	95	CSC	1	0.6	GLASS	CLEAR			
95	95	CSC	1	2.4	GLASS	JLID	MILK		
95	95	CSC	1	3.6	METAL	FERS			
95	100	CSC	2	6.9	GLASS	CURVE	CLEAR		
95	100	CSC	6	4.4	GLASS	CURVE	BROWN		
95	100	CSC	1	4.4	EARTH	WHITE	RIM		
95	100	CSC	1	3.3	METAL	BCAP	TWIST		
95	100	CSC	1	1.9	CHIST	BATCOR			
95	100	CSC	10	8.3	METAL	METOBJ			
95	100	CSC	1	0.5	BRICK				
95	100	CSC	1	0.1	ANIM	BONE			
95	100	CSC	1	4.5	SYN	PLAST			
95	100		2	51.3	URM	CRT			
95	105	CSC	2	4.0	GLASS	CURVE	CLEAR		
95	105	CSC	2	2.0	GLASS	CURVE	BROWN		
95	105	CSC	1	0.3	SYN	PLAST	TOY		
95	105	CSC	1	5.3	SYN	LINM			
100	65	CSC	1	0.1	GLASS	CURVE	MILK		
100	65	CSC	3	4.8	GLASS	CURVE	CLEAR		
100	65	CSC	1	2.9	GLASS	CURVE	BLUE		
100	65	CSC	3	11.2	METAL	FERS			
100	70	CSC	3	4.0	GLASS	CURVE	CLEAR		
100	70	CSC	1	0.8	GLASS	CURVE	LBRN		
100	70	CSC	1	0.5	GLASS	CURVE	BLUE		
100	70	CSC	1	0.4	EARTH	WHITE	RIM	UNDEC	
100	70	CSC	4	5.9	METAL	FERS	METOBJ		
100	70	CSC	1	0.2	FOSSI	SHING	ROOF		
100	75	CSC	2	1.3	METAL	METOBJ			
100	75		1	3.0	URM PEBL				
100	75	CSC	1	17.3	GLASS	ROBASE	CLEAR	MARPAR	EMBOSS
100	75	CSC	3	3.0	GLASS	CURVE	CLEAR		
100	75	CSC	1	0.7	GLASS	CURVE	CLEAR	MOLD	
100	80	CSC	1	0.4	SYN	PLAST			
100	80	CSC	1	4.4	GLASS	MLID			
100	80	CSC	1	2.4	EARTH	WHITE	BODY	UNDEC	
100	80	CSC	1	0.3	METAL	METOBJ			
100	80	CSC	1	0.9	FOSSI				
100	80		1	5.0	URM CHNK				
100	85	CSC	2	1.4	GLASS	CURVE	CLEAR		
100	85	CSC	1	0.9	GLASS	CURVE	GREEN		
100	85	CSC	1	2.0	GLASS	CURVE	BROWN		
100	85	CSC	1	6.5	GLASS	BNECK	BROWN	MOLD	THREAD

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT						
100	85	CSC	3	4.6	METAL		FERS			
100	85		1	4.2	URM		CRT			
100	90	CSC	6	8.7	GLASS		CURVE	CLEAR		
100	90	CSC	2	3.2	GLASS		CURVE	BROWN		
100	90	CSC	21	11.2	METAL		FERS			
100	90		1	5.3	URM		CRT			
100	95	CSC	4	9.1	GLASS		CURVE	CLEAR		
100	95	CSC	1	17.2	GLASS		FLAT	LBLUE		
100	95	CSC	1	2.2	EARTH		WHITE	UNDEC		
100	95	CSC	1	5.7	EARTH		WHITE	MOLD		
100	95	CSC	6	3.0	METAL		FERS			
100	95		1	2.7	URM	CHNK				
100	100	CSC	2	4.0	GLASS		CURVE	CLEAR		
100	100	CSC	3	20.0	GLASS		FLAT			
100	100	CSC	1	0.9	GLASS		BASE			
100	100	CSC	2	4.1	GLASS		CURVE	MOLD		
100	100	CSC	1	1.8	GLASS		CURVE	BROWN		
100	100	CSC	1	0.4	GLASS		FLAT	FROST		
100	100	CSC	1	0.4	SYN		RUBBER			
100	105	CSC	7	13.2	GLASS		CURVE	CLEAR		
100	105	CSC	5	10.5	GLASS		CURVE	BROWN		
100	105	CSC	1	3.0	GLASS		FLAT	BROWN		
100	105	CSC	1	0.1	GLASS		FLAT	GREEN		
100	105	CSC	1	48.5	GLASS		BASE	RSB		
100	105	CSC	1	2.3	EARTH		WHITE	BODY	UNDEC	
100	105	CSC	2	76.4	METAL		FERS	SPIKE		
100	105	CSC	2	9.9	METAL		FERS	NAIL	WIRE	COMMON
100	105	CSC	3	13.1	METAL		FERS	METOBJ		
100	105	CSC	1	912.0	BRICK					
100	105	CSC	1	0.5	SYN		PLAST	COMB		
100	105	CSC	8	18.3	GLASS		CURVE	CLEAR		
100	105	CSC	2	8.4	GLASS		CURVE	COBALT		
100	105	CSC	2	13.7	GLASS		FLAT	CLEAR		
100	105	CSC	2	27.9	GLASS		BASE	CLEAR	RSB	
100	105	CSC	1	1.0	GLASS		FLAT	BROWN		
100	105	CSC	1	4.2	EARTH		WHITE	BODY	UNDEC	
100	105	CSC	1	3.6	EARTH		WHITE	RIM	UNDEC	
100	105	CSC		6.7	METAL		FERS	METOBJ		
100	105	CSC	2	1.8	FOSSI		IND			
100	105		1	31.6	URM	CHNK	LS			
100	105		1	1.0	ANIM		BONE			
100	110	CSC	1	0.5	SYN		PLAST	BUTTON		
100	110	CSC	1	2.2	EARTH		WHITE	BODY		
100	110	CSC	3	12.2	GLASS		CURVE	MOLD	CLEAR	
100	110	CSC	4	14.3	GLASS		CURVE	CLEAR		
100	110	CSC	5	8.8	GLASS		FLAT	CLEAR		
100	110	CSC	1	0.7	GLASS		CLEAR			
100	110	CSC	3	12.3	GLASS		CURVE	BROWN	MOLD	

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT					
100	110	CSC	1	2.0	GLASS		CURVE	LBLUE	
100	110	CSC	1	2.1	GLASS		CURVE	COBALT	
100	110	CSC	3	77.2	METAL		FERS	METOBJ	
100	110		2	1.4	URM		CANC		
100	110	CSC	1	1.4	FOSSI		IND		
100	110		3	35.9	URM	PEBL	CRT		
100	110		1	4.1	ANIM		UNMOD		
100	115	CSC	7	23.7	GLASS		CURVE	CLEAR	
100	115	CSC	2	5.0	GLASS		FLAT	CLEAR	
100	115	CSC	1	7.2	GLASS		JAR	MILK	MOLD
100	115	CSC	1	8.2	GLASS		MLID	MILK	
100	115	CSC	1	0.7	EARTH		WHITE	BODY	UNDEC
100	115	CSC	1	1.3	EARTH		WHITE	RIM	UNDEC
100	115	CSC	1	0.6	METAL		BRASS	AMMO	
100	115	CSC	1	492.0	METAL		FERS	CHAIN	
100	115	CSC	1	8.3	GLASS		BASE	SB[illegible]GAL	
100	115		1	6.0	METAL		FERS	METOBJ	
100	120	CSC	3	5.1	GLASS		CURVE	CLEAR	
100	120	CSC	1	1.6	GLASS		CURVE	BROWN	
100	120	CSC	2	5.3	GLASS		FLAT	BROWN	
100	120	CSC	1	10.4	GLASS		BASE	CLEAR	
100	120	CSC	1	5.0	GLASS		MLID	MILK	
100	120	CSC	1	2.8	PORCE		TABLE		
100	120	CSC	1	3.5	EARTH		WHITE	RIM	UNDEC
105	100	CSC	12	18.5	GLASS		CURVE	CLEAR	
105	100	CSC	1	1.8	GLASS		FLAT	CLEAR	
105	100	CSC	1	2.0	GLASS		RIM	CLEAR	
105	100	CSC	1	14.1	GLASS		SQUARE		
105	100	CSC	1	0.7	GLASS		CURVE	[illegible]UE	
105	100	CSC	1	2.3	METAL		BCAP	1 ST	
105	100	CSC	1	0.6	SYN		PLAST		
105	100	CSC	7	11.0	METAL		METOBJ		
105	100	CSC	1	6.8	METAL		NAIL	BATCOR	
105	100	CSC	1	0.7	FOSSI		IND		
105	100	CSC	1	0.1	URM		CANC		
105	100	CSC	3	10.4	URM		CRT		
105	105	CSC	4	12.0	GLASS		CURVE	CLEAR	
105	105	CSC	4	3.1	GLASS		FLAT	CLEAR	
105	105	CSC	1	2.6	GLASS		CURVE	CLEAR	MOL[illegible]
105	105	CSC	1	0.7	EARTH		WHITE	MOLD	
105	105	CSC	8	10.7	METAL		FERS	METOBJ	
105	105		1	2.2	URM	CHNK	CRT	FC	
105	105	CSC	1	501.0	METAL		FERS	STOVE	DOOR
105	105	CSC	1	10.3	METAL		WIRE	COMMON	NAIL
105	105	CSC	1	4.0	METAL		ALUM	METOBJ	
105	105	CSC	1	6.9	SYN		PLAST	TOY	
105	110	CSC	1	3.7	PORCE		TABLE		
105	110	CSC	1	2.8	EARTH		TRA C	BLUE	

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT							
105	110	CSC	4	23.8	EARTH		WHITE	RIM	UNDEC		
105	110	CSC	2	9.8	EARTH		WHITE	BASE	UNDEC		
105	110	CSC	2	3.2	EARTH		WHITE	BODY	UNDEC		
105	110	CSC	1	6.8	GLASS		CURVE	MILK	DECAL		
105	110	CSC	1	2.9	GLASS		MLID	MILK			
105	110	CSC	1	2.2	GLASS		CURVE	MOLD	MILK		
105	110	CSC	1	0.8	GLASS		CURVE	PAINT			
105	110	CSC	1	0.3	GLASS		FROST				
105	110	CSC	1	0.6	GLASS		FLAT	CLEAR			
105	110	CSC	1	5.1	GLASS		JRIM	MOLD	THREAD	COBALT	
105	110	CSC	1	11.1	GLASS		JBASE	MOLD	COBALT		
105	110	CSC	3	11.2	GLASS		CURVE	COBALT			
105	110	CSC	1	52.7	GLASS		BBASE	SBASAL	LGRN		
105	110	CSC	1	14.0	GLASS		JRIM	MOLD	LBLUE	THREAD	
105	110	CSC	1	3.5	GLASS		CURVE	BROWN			
105	110	CSC	1	37.9	GLASS		BASE	RSB	CLEAR		
105	110	CSC	1	8.6	GLASS		BASE	CLEAR	MOLD		
105	110	CSC	3	6.4	GLASS		CURVE	MOLD	CLEAR		
105	110	CSC	12	56.2	GLASS		CURVE	CLEAR			
105	110	CSC	2	2.5	FOSSI		IND				
110	100	CSC	7	14.1	GLASS		CURVE				
110	100	CSC	1	5.2	GLASS		CURVE	MOLD			
110	100	CSC	2	6.1	EARTH		WHITE				
110	100	CSC	1	0.5	EARTH		WHITE	HANDLE			
110	100	CSC	1	0.1	EARTH		WHITE	TRANS			
110	100	CSC	1	27.5	GLASS		BASE	BROWN			
110	100	CSC	1	0.5	GLASS		CURVE	BROWN			
110	100	CSC	1	0.9	GLASS		CURVE	MILK	GREEN		
110	100	CSC	1	0.9	SYN		PLAST				
110	100	CSC	2	1.5	METAL		METOBJ				
110	100	CSC	2	24.1	URM		CRT				
110	105	CSC	1	0.4	URM	CHNK					
110	105	CSC	3	3.8	GLASS		CURVE	CLEAR			
110	105	CSC	2	1.0	GLASS		FLAT	CLEAR			
110	105	CSC	2	2.4	GLASS		CURVE	CLEAR	MOLD		
110	105	CSC	1	1.4	GLASS		CURVE	CLEAR	EMBOSS		
110	105	CSC	1	5.5	GLASS		RIM	TABLE	LGRN	MILK	MOLD
110	105	CSC	1	2.0	GLASS		CURVE	BROWN	MOLD		
110	105	CSC	4	4.7	GLASS		CURVE	BROWN	MOLD	EMBOSS	
110	105	CSC	1	0.8	GLASS		BASE	GREEN			
110	105	CSC	1	3.9	GLASS		LGRN	PRESS			
110	105	CSC	1	0.1	FLOR		CHARC				
110	105	CSC	1	2.6	EARTH		WHITE	UNDEC			
110	105	CSC	1	0.6	EARTH		WHITE	DECAL			
110	105	CSC	4	3.7	METAL		FERS	METOBJ			
110	105	CSC	1	7.3	METAL		WIRE	NAIL			
110	105	CSC	1	0.5	SYN		PLAST				
110	105	CSC	2	4.8	EARTH		WHITE	BODY	MONOG	BLUE	

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT						
110	110	CSC	1	0.9	SYN		LINM			
110	110	CSC	1	0.8	EARTH		REDWAR			
110	110	CSC	1	5.2	EARTH		WHITE	RIM	UNDEC	
110	110	CSC	2	7.9	EARTH		WHITE	RIM	MOLD	
110	110	CSC	1	3.6	EARTH		WHITE	DECAL		
110	110	CSC	8	28.8	GLASS		CURVE	CLEAR		
110	110	CSC	3	5.5	GLASS		CURVE	MOLD	CLEAR	
110	110	CSC	3	7.8	GLASS		FLAT	CLEAR		
110	110	CSC	2	0.7	GLASS		CURVE	GREEN		
110	110	CSC	1	2.0	GLASS		CURVE	LBLUE		
110	110	CSC	1	0.4	GLASS		CURVE	MILK		
110	110	CSC	3	22.1	METAL		FERS	METOBJ		
110	110		1	3.9	URM	CHNK	CRT			
115	100	CSC	7	13.5	GLASS		CURVE	CLEAR		
115	100	CSC	5	6.2	GLASS		FLAT	CLEAR		
115	100	CSC	1	5.5	GLASS		BRIM	GREEN		
115	100	CSC	1	5.5	GLASS		BRIM	GREEN		
115	100	CSC	1	1.3	GLASS		CURVE	GREEN		
115	100	CSC	6	7.5	GLASS		CURVE	BROWN		
115	100	CSC	1	0.6	GLASS		CURVE	WHITE	MILK	
115	100	CSC	1	2.6	GLASS		MLID	MILK	EMBOSS	
115	100	CSC	2	1.7	EARTH		WHITE			
115	100	CSC	1	0.8	SYN		PLAST	GREEN		
115	100	CSC	8	10.5	METAL		METOBJ			
115	100	CSC	1	5.1	METAL		COMMON	NAIL		
115	100	CSC	1	13.1	METAL		ALUM			
115	100		8	113.1	URM		CRT			
115	100		1	15.7	CL	PEBL	TESTED	CRT		
115	100	CSC	1	1.4	GLASS		CURVE	BROWN	MOLD	
115	105	CSC	7	2.8	METAL		FERS	METOBJ		
115	105	CSC	2	13.2	METAL		NAIL	WIRE	COMMON	
115	105	CSC	1	0.9	GLASS		FLAT	CLEAR		
115	105	CSC	1	1.5	GLASS		NECK	CLEAR	MOLD	
115	105	CSC	1	5.4	GLASS		CURVE	CLEAR		
115	105	CSC	2	28.8	GLASS		CURVE	GREEN		
115	105	CSC	1	7.5	GLASS		RBASE	CLEAR	MOLD	
115	110	CSC	2	1.5	SYN		PLAST			
115	110	CSC	3	9.4	GLASS		CURVE	CLEAR		
115	110	CSC	1	26.9	STONE		ALBALB			
115	110	CSC	1	4.8	METAL		FERS	COMMON	WIRE	NAIL
115	110	CSC	1	15.2	METAL		HBOLT			
115	110	CSC	1	5.8	METAL		METOBJ			
115	110	CSC	1	0.8	FOSSI		IND			
120	100	CSC	1	7.2	EARTH		WHITE	BODY	TRANS	BLUE
120	100	CSC	1	4.3	EARTH		WHITE	RIM	MOLD	
120	100	CSC	1	3.0	EARTH		WHITE	RIM	RTREAT	MOLD
120	100	CSC	1	2.6	EARTH		WHITE	BODY	UNDEC	
120	130	CSC	1	0.6	EARTH		WHITE	RIM	MONOG	

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT						
120	100	CSC	5	13.0	GLASS	FLAT	CLEAR			
120	100	CSC	26	34.4	GLASS	CURVE	CLEAR			
120	100	CSC	2	6.0	GLASS	CURVE	BLUE			
120	100	CSC	4	8.2	GLASS	CURVE	BROWN			
120	100		3	33.2	URM	CRT				
120	100	CSC	1	32.5	GLASS	BBASE	UNDEC	SBASAL	GREEN	*ARCOM
120	100	CSC	1	18.2	GLASS	BBASE	UNDEC	SBASAL	CLEAR	
120	100	CSC	4	1117.6	BRICK	FR				
120	100	CSC	1	1.2	SYN	PLAST	TABLE			
120	100		1	3.6	ANIM					
120	100	CSC	8	4.2	METAL	FERS	METOBJ			
120	110	CSC	13	21.9	GLASS	CURVE	CLEAR			
120	110	CSC	4	6.4	GLASS	FLAT	CLEAR			
120	110	CSC	1	2.8	GLASS	CURVE	GREEN			
120	110	CSC	1	1.0	GLASS	CLEAR	MOLD			
120	110	CSC	1	2.1	GLASS	CURVE	BROWN			
120	110	CSC	5	16.8	GLASS	CURVE	BROWN	MOLD		
120	110	CSC	2	8.6	GLASS	BBASE	CLEAR	EMBOSS	MOLD	RSB
120	110	CSC	1	7.7	GLASS	BNECK	CLEAR	THREAD	SLIP	
120	110	CSC	1	4.9	GLASS	BNECK	THREAD	CLEAR		
120	110	CSC	1	2.7	GLASS	CURVE	CLEAR	EMBOSS		
120	110	CSC	1	5.3	GLASS	BASE	EMBOSS	LGRN		
120	110	CSC	2	2.8	GLASS	RIM	MOLD	CLEAR		
120	110	CSC	1	1.7	GLASS	LID	MILK			
120	110	CSC	8	7.9	METAL	METOBJ				
120	110	CSC	1	3.5	METAL	NAIL	COMMON			
120	110	CSC	2	1.4	METAL	FERS				
120	110	CSC	1	2.2	FOSSI	TAR				
120	110	CSC	1	1.3	EARTH	WHITE	UNDEC			
120	110	CSC	1	14.4	EARTH	WHITE	MOLD			
120	110	CSC	1	1.2	SYN	LINM				
120	110	CSC	1	0.1	SYN	PLAST				
125	100	CSC	17	17.4	GLASS	CURVE	CLEAR			
125	100	CSC	3	4.6	GLASS	FLAT	LGRN			
125	100	CSC	2	4.2	GLASS	CURVE	MOLD	CLEAR		
125	100	CSC	1	6.1	GLASS	CURVE	DGRN			
125	100	CSC	3	3.0	GLASS	CURVE	BROWN			
125	100	CSC	1	1.1	EARTH	WHITE				
125	100	CSC	1	3.5	METAL	WIRE	NAIL			
125	100	CSC	1	1.8	SYN	PLAST	BCAP			
125	100	CSC	10	9.1	METAL	METOBJ				
125	100	CSC	1	1.0	SYN	RUBBER				
125	100		12	286.9	URM	CRT				
125	100	CSC	2	2.5	METAL	METOBJ				
125	105	CSC	1	3.2	EARTH	WHITE	RIM	UNDEC		
125	105	CSC	1	1.3	EARTH	WHITE	RIM	MONCS	YELLOW	
125	105	CSC	1	7.6	GLASS	BNECK	CLEAR	MOLD	STOPPE	STL
125	105	CSC	1	13.4	GLASS	BBASE	CLEAR	MOLD		

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT #	CT	WT							
125	105	CSC	5	83.8	GLASS	CURVE	CLEAR	MOLD			
125	105	CSC	1	14.0	GLASS	BASE	CLEAR	RSB			
125	105	CSC	8	86.9	GLASS	CURVE	CLEAR				
125	105	CSC	13	22.4	GLASS	FLAT	CLEAR				
125	105	CSC	1	10.3	GLASS	CURVE	MOLD	BROWN			
125	105	CSC	1	1.7	GLASS	CURVE	LBLUE				
125	105	CSC	6	5.1	METAL	FERS	METOBJ				
125	105	CSC	2	55.1	BRICK						
125	105		1	0.4	URM	PEBL					
125	110	CSC	2	2.9	GLASS	FLAT	LGRN				
125	110	CSC	7	14.2	GLASS	CURVE	CLEAR				
125	110	CSC	1	0.2	GLASS	CLEAR					
125	110	CSC	3	7.8	GLASS	CURVE	CLEAR	MOLD			
125	110	CSC	1	12.7	GLASS	CURVE	CLEAR	PAINT			
125	110	CSC	1	14.2	GLASS	BASE	CLEAR				
125	110	CSC	1	13.3	GLASS	BASE	LGRN	MOLD			
125	110	CSC	1	7.5	GLASS	BASE	CLEAR	EMBOSS	SBASAL		
125	110	CSC	1	62.2	GLASS	BBASE	LIQUOR	CLEAR	EMBOSS	MARCOM	RSB
125	110	CSC	1	5.3	GLASS	CURVE	BROWN				
125	110	CSC	1	4.2	GLASS	CURVE	BROWN	MOLD			
125	110	CSC	3	2.1	METAL	ALUM	METOBJ				
125	110	CSC	2	3.5	METAL	FERS	METOBJ				
125	110	CSC	1	22.1	METAL	FERS	WIRE				
125	110	CSC	2	4.3	EARTH	WHITE	UNDEC				
125	110	CSC	1	0.7	URM	CANC					
125	110	CSC	1	0.6	OHIST	WOOD					
130	100	CSC	5	7.4	GLASS	CURVE	CLEAR				
130	100	CSC	1	13.0	GLASS	BASE	CLEAR				
130	100	CSC	1	13.2	EARTH	WHITE	BODY	UNDEC			
130	100	CSC	3	13.0	ANIM						
130	105	CSC	1	1.2	GLASS	FLAT	CLEAR				
130	105	CSC	3	5.2	GLASS	CURVE	CLEAR				
130	105	CSC	1	19.6	GLASS	SQUARE	BOTTLE	CLEAR			
130	105	CSC	1	16.9	GLASS	BASE	MOLD	CLEAR	MARCOM	SBASAL	
130	105	CSC	1	3.1	GLASS	CURVE	CLEAR	EMBOSS			
130	105	CSC	1	2.6	GLASS	CURVE	CLEAR	MOLD			
130	105	CSC	1	4.7	EARTH	WHITE	MOLD				
130	105	CSC	1	2.6	SYN	PLAST	BCAP				
130	110	CSC	4	5.9	GLASS	FLAT	ALBUN				
130	110	CSC	7	19.2	GLASS	CURVE	CLEAR				
130	110	CSC	4	7.0	GLASS	CURVE	CLEAR	MOLD			
130	110	CSC	1	6.0	GLASS	BASE	CLEAR	MOLD	EMBOSS		
130	110	CSC	1	1.9	GLASS	BNECK	MOLD				
130	110	CSC	1	2.2	GLASS	SQUARE	CLEAR	EMBOSS			
130	110	CSC	1	0.4	GLASS	CURVE	BROWN	MOLD			
130	110	CSC	1	4.1	GLASS	JLID	MOLD	MILK			
130	110	CSC	2	11.1	EARTH	WHITE					
130	110		1	39.2	URM	CHNK	QZIT				

TABLE C-10
3MS474 ARTIFACTS

N	E	UNIT	#	CT	WT						
130	110	CSC		1	2.9	METAL		FERS	WIRE		
130	110	CSC		3	31.8	METAL		FERS	METOBJ		
130	110			1	1.9	URM		CANC			
130	110			1	0.3	POT		BODYFG	SAND		
130	110	CSC		4	14.2	ANIM		BONE			
130	110	CSC		1	2.6	FOSSI		IND			
		GENE		1	36.0	GLASS		BNECK	GREEN	SLIP	THREAD
		GENE		1	1.9	EARTH		HANDLE	BLUE		
				1	102.2	URM		CRT			
		1X1M	1	4	7.1	GLASS		CURVE	CLEAR		
		1X1M	1	1	5.2	GLASS		SQUARE	CLEAR		
		1X1M	1	1	1.3	GLASS		CURVE	CLEAR	MOLD	
		1X1M	1	1	7.3	GLASS		RIM	CLEAR	MOLD	
		1X1M	1	2	9.2	GLASS		BASE	EMBOSS	CLEAR	
		1X1M	1	2	8.3	METAL		FERS	NAIL	COMMON WIRE	
		1X1M	1	4	4.3	METAL		FERS			
		1X1M	1	1	1.7	URM	CHNK	CANC			
		1X1M	1	5	26.8	URM		IND			
		1X1M	1	1	20.5	URM	CHNK	CRT	FC		
		1X1M	1	1	3.2	GLASS		BASE	CLEAR		
		1X1M	1	8	5.7	GLASS		CURVE	CLEAR		
		1X1M	1	1	0.1	CL	FLA	CRT			
		1X1M	1	6	12.1	METAL		FERS			
		1X1M	1	1	2.3	URM	CHNK	CANC			
		1X1M	1	1	6.2	SYN		PLAST	IND		
		1X1M	1	1	8.2	BRICK					
		1X1M	1	3	8.4	GLASS		FLAT	LGRN		
		1X1M	1	1	6.1	GLASS		CURVE	CLEAR	MOLD	
		1X1M	1	5	10.2	GLASS		CURVE	CLEAR		
		1X1M	1	1	4.7	GLASS		MELT	CLEAR		
		1X1M	1	1	0.9	GLASS		MLID	MILK		
		1X1M	1	1	4.6	METAL		BUTTON			
		1X1M	1	1	14.7	METAL		NAIL			
		1X1M	1	8	12.5	METAL					

Number of artifacts in printout: 514
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 5:20

TABLE C-11 3MS474 ARTIFACTS FROM TEST UNIT BY DEPTH

__N__E__UNIT_#__TOP__BOTTM__CT___WT________________________________

—) SNO = 3MS474

BDEPTH = 10

1X1M	1	1.00	10.00	1	7.3	GLASS		RIM	CLEAR	MOLD	
1X1M	1	1.00	10.00	2	9.2	GLASS		BASE	EMBOSS	CLEAR	
1X1M	1	1.00	10.00	1	1.3	GLASS		CURVE	CLEAR	MOLD	
1X1M	1	1.00	10.00	4	7.1	GLASS		CURVE	CLEAR		
1X1M	1	1.00	10.00	1	5.2	GLASS		SQUARE	CLEAR		
1X1M	1	0.00	10.00	5	26.8	URM		IND			
1X1M	1	0.00	10.00	1	20.5	URM	CHNK	CRT	FC		
1X1M	1	1.00	10.00	1	1.7	URM	CHNK	CANC			
1X1M	1	1.00	10.00	2	8.3	METAL		FERS	NAIL	COMMON	WIRE
1X1M	1	1.00	10.00	4	4.3	METAL		FERS			

CT	22.00	2.200	71.00
WT	91.70	9.170	273.70

SNO = 3MS474

—) BDEPTH = 20

1X1M	1	10.00	20.00	1	0.1	CL	FLA	CRT		
1X1M	1	10.00	20.00	8	5.7	GLASS		CURVE	CLEAR	
1X1M	1	10.00	20.00	1	3.2	GLASS		BASE	CLEAR	
1X1M	1	10.00	20.00	1	2.0	URM	CHNK	CANC		
1X1M	1	10.00	20.00	6	12.1	METAL		FERS		
1X1M	1	10.00	20.00	1	6.2	SYN		PLAST	IND	

CT	18.00	3.000	89.00
WT	29.30	4.883	303.00

SNO = 3MS474

—) BDEPTH = 30

1X1M	1	20.00	30.00	5	10.2	GLASS	CURVE	CLEAR	
1X1M	1	20.00	30.00	1	4.7	GLASS	MELT	CLEAR	
1X1M	1	20.00	30.00	1	0.9	GLASS	MLID	MILK	
1X1M	1	20.00	30.00	3	8.4	GLASS	FLAT	LGRN	
1X1M	1	20.00	30.00	1	6.1	GLASS	CURVE	CLEAR	MOLD
1X1M	1	20.00	30.00	1	14.7	METAL	NAIL		
1X1M	1	20.00	30.00	8	12.5	METAL			
1X1M	1	20.00	30.00	1	4.6	METAL	BUTTON		
1X1M	1	20.00	30.00	1	8.2	BRICK			

Variable:	Subtotal:	Mean:	Running total:
CT	22.00	2.444	111.00
WT	70.30	7.811	373.30

TABLE C-12
3MS473 ARTIFACTS

N	E	UNIT #	CT	WT						
37	94		1	1.5	POT		BODY	PLAIN SAND		
50	85			0.2	CL	FLA	CRT			
50	95		2	0.6	POT		BODYFG	PLAIN SAND		
55	95		1	0.1	URM	CHNK	CRT	FC		
60	95		1	1.7	CL	FLA	DECORT	CRT		
65	95			0.1	CL	FLA	DECORT	CRT		
85	95	CSC	1	5.8	EARTH		WHITE	UNDEC		
85	95	CSC	1	12.9	STONE		BRSBRS			
85	95	CSC	1	0.7	GLASS		FLAT	CLEAR		
85	95	CSC	1	0.7	GLASS		CURVE	CLEAR		
90	60	CSC	2	2.1	GLASS					
90	65	CSC	5	27.1	GLASS		CURVE	CLEAR		
90	65	CSC	1	29.2	GLASS		JBASE	CLEAR		
90	65	CSC	1	6.3	GLASS		BBASE	LGRN	MARPAR	
90	65	CSC	1	2.6	OHIST		GRAPH	BATCOR		
90	65	CSC	1	60.8	METAL		FERS	METOBJ		
90	65	CSC	1	4.2	EARTH		WHITE			
90	65	CSC	1	8.2	GLASS		SQBASE	CLEAR	EMBOSS	
90	75	CSC	1	0.5	GLASS		FLAT	CLEAR		
90	75	CSC	1	1.2	GLASS		CURVE	CLEAR		
90	75	CSC	1	1.0	OHIST		GRAPH	BATCOR		
90	75	CSC	1	3.1	FOSSI					
90	75		1	0.9	POT		BODY	PLAIN SHELL		
90	75		1	0.3	URM	PEBL				
90	80	CSC	1	14.4	EARTH		WHITE	RIM	MOLD	DECAL
90	80	CSC	1	0.6	EARTH		WHITE			
90	80	CSC	1	9.1	GLASS		BASE	CLEAR	PRESS	
90	80	CSC	1	2.9	GLASS		NECK	SLIP	THREAD	
90	80	CSC	1	2.3	GLASS		CURVE	CLEAR	MOLD	
90	80	CSC	1	1.2	GLASS		CURVE	CLEAR		
90	80	CSC	1	0.4	GLASS		FLAT	CLEAR		
90	80	CSC	1	1.9	GLASS		FLAT	LGRN		
90	80	CSC	1	2.2	OHIST		GRAPH	BATCOR		
90	80	CSC	1	0.6	SYN		RUBBER			
90	80	CSC	2	3.7	METAL		FERS			
90	80	CSC	2	1.2	METAL		WIRE			
90	85	CSC	2	8.8	GLASS		FLAT	CLEAR		
90	85	CSC	5	GLASS		CURVE	CLEAR			
90	85	CSC	1	10.5	GLASS		CURVE	LGRN		
90	85	CSC	1	5.5	GLASS		CURVE	MOLD	PINK	
90	85	CSC	1	23.4	GLASS		BBASE	CLEAR	EMBOSS	
90	85	CSC	1	2.9	GLASS		JRIM	CLEAR		
90	85	CSC	1	1.8	GLASS		BNECK	CLEAR		
90	85	CSC	1	5.0	GLASS		CURVE	CLEAR	MOLD	
90	85	CSC	1	12.1	GLASS		CURVE	COBALT		
90	85	CSC	1	1.1	EARTH		WHITE			
90	85	CSC	1	9.5	EARTH		WHITE	RIM	DECAL	
90	85	CSC	2	3.0	EARTH		WHITE	RIM		

TABLE C-12
3MS473 ARTIFACTS

N	E	UNIT #	CT	WT				
90	85	CSC	1	11.8	PORCE	UNDEC		
90	90	CSC	2	1.8	GLASS	FLAT	CLEAR	
90	90	CSC	1	12.6	GLASS	BBASE	CLEAR	
90	90	CSC	1	1.0	GLASS	CURVE	LBLUE	
90	90	CSC	1	39.4	STONE	BRSBRS	MARPAR	
90	95	CSC	1	1.0	GLASS	CURVE	RIM	CLEAR
90	95	CSC	1	12.5	GLASS	CURVE	MILK	
90	95		1	1.1	POT	BODYFG		
90	100	CSC	1	20.2	STONE	RIM	BRSBRS	
90	100	CSC	2	6.0	GLASS	CURVE	CLEAR	
90	100	CSC	1	5.8	GLASS	CURVE	LGRN	
90	100	CSC	1	1.0	METAL	FERS		
90	105	CSC	1	1.0	GLASS	CURVE	CLEAR	
90	105	CSC	2	9.9	STONE	ALBBRS		
90	110	CSC	1	7.4	GLASS	CURVE	CLEAR	
90	110	CSC	1	7.6	GLASS	CURVE	CLEAR	
90	110	CSC	1	12.2	GLASS	PLATE	PRESS	PINK
90	110	CSC	1	16.2	STONE	BRSBRS		
90	110	CSC	1	0.6	METAL	FERS	NAIL	
90	110		1	0.1	CL FLA	CRT		
90	115	CSC	1	7.4	GLASS	BNECK	CLEAR	THREAD
90	115	CSC	1	3.5	MORTA			
90	120	CSC	1	0.2	GLASS	CURVE	CLEAR	
90	125	CSC	1	5.5	EARTH	WHITE		
90	125	CSC	1	41.4	GLASS	SQUARE	BOTTLE	CLEAR
95	60		1	0.9	POT	BODYFG	PLAIN	SHELL
95	60		1	2.4	ANIM	BONE	MIN	
95	60			246.4	URM	PEWD	MIN	
95	65	CSC	1	8.2	GLASS	JNECK	THREAD	
95	65	CSC	1	6.3	FOSSI	IND		
95	70	CSC	1	1.0	GLASS	FLAT	CLEAR	
95	70	CSC	1	0.7	GLASS	CURVE	LBLUE	
95	70	CSC	1	0.3	ANIM			
95	70	CSC	1	0.4	METAL	FERS		
95	75	CSC	2	15.4	GLASS	JRIM	CLEAR	SLIP
95	75	CSC	1	9.1	GLASS	CURVE	CLEAR	PRESS
95	75	CSC	4	17.1	GLASS	CURVE	CLEAR	
95	75	CSC	1	2.0	GLASS	FLAT	CLEAR	
95	75	CSC	1	13.8	GLASS	CURVE	COBALT	
95	75	CSC		36.0	METAL	FERS		
95	75	CSC	1	0.8	METAL	ALUM		
95	75	CSC	1	1.2	BRICK	FR		
95	80	CSC	3	18.1	GLASS	CURVE	CLEAR	PRESS
95	80	CSC	8	25.6	GLASS	CURVE	CLEAR	
95	80	CSC	1	1.2	GLASS	CURVE	LGRN	
95	80	CSC	1	3.1	GLASS	FLAT	CLEAR	
95	80	CSC	1	9.8	GLASS	BNECK	THREAD	
95	80	CSC	1	3.0	CHIST	GRAPH	BATCOR	

TABLE C-12
3MS473 ARTIFACTS

N	E	UNIT	#	CT	WT							
95	80	CSC		1	7.2	MORTA						
95	80	CSC			22.4	METAL		FERS				
95	80			1	0.9	POT		BODY	PLAIN SHELL			
95	80	CSC		1	3.4	FOSSI						
95	85	CSC		1	43.4	GLASS		BASE	CLEAR	RSB	EMBOSS	
95	85	CSC		1	23.5	GLASS		BASE	LAV	RSB	MARCOM	EMBOSS
95	85	CSC		1	24.2	GLASS		BASE	CLEAR	RSB		
95	85	CSC		8	37.3	GLASS		CURVE	CLEAR			
95	85	CSC		1	7.7	GLASS		JNECK	THREAD			
95	85	CSC		2	5.4	GLASS		FLAT	CLEAR			
95	85	CSC		1	7.1	GLASS		CURVE	MOLD			
95	85	CSC		1	23.3	GLASS		CURVE	GREEN	PRESS		
95	85	CSC		1	53.5	GLASS		BOWL	MILK			
95	85	CSC		1	2.3	GLASS		MLID	MILK			
95	85	CSC		1	6.7	STONE		BASE	ALBBRS			
95	85	CSC		3	21.2	FOSSI						
95	85			1	3.7	CL	FLA	DECORT	CRT			
95	85	CSC		4	6.6	METAL		NAIL				
95	85	CSC		30	31.0	METAL		FERS				
95	90	CSC		3	25.5	GLASS		CURVE	CLEAR			
95	90	CSC		1	5.9	PORCE		TABLE	DECAL			
95	90			1	13.4	CL	PEBL	TESTED	CRT			
95	95	CSC		1	6.5	GLASS		FLAT	CLEAR			
95	95	CSC		1	1.1	GLASS		CURVE	CLEAR			
95	95	CSC			5.2	METAL		FERS				
95	100	CSC		1	5.8	GLASS		CURVE	CLEAR			
95	100	CSC		2	1.5	GLASS		FLAT	CLEAR			
95	100	CSC			3.1	METAL		FERS				
95	105	CSC		1	36.0	GLASS		BASE	LGRN			
95	105	CSC		1	4.6	EARTH		WHITE				
95	105	CSC		4	[illegible].1	METAL		FERS				
95	110			1	2.2	CL	FLA	CRT				
95	110	CSC		1	0.7	GLASS		CURVE	BROWN			
97	102	1X1M	1	3	60.0	STONE		BRSBRS				
100	60			1	2.1	POT		BODY	PLAIN SAND			
100	70	CSC		1	9.3	BRICK		FR				
100	70	CSC		1	1.4	METAL		FERS	WIRE	NAIL		
100	70	CSC		1	1.8	METAL		FERS				
100	70			1	1.0	CL	FLA	CRT				
100	75	CSC		1	2.6	GLASS		CURVE	CLEAR	PRESS		
100	75	CSC			2.0	METAL		FERS				
100	80	CSC		1	22.9	GLASS		RIM	CLEAR			
100	80	CSC		2	19.4	GLASS		JRIM	CLEAR	THREAD		
100	80	CSC		7	46.4	GLASS		CURVE	CLEAR			
100	80	CSC		4	23.0	GLASS		CURVE	MOLD	CLEAR		
100	80	CSC		1	4.0	GLASS		CURVE	LGRN	PRESS		
100	80	CSC		1	17.5	GLASS		JNECK	LBLUE	SSHLDR		
100	80	CSC		1	2.0	GLASS		CURVE	LBLUE			

TABLE C-12
3MS473 ARTIFACTS

N	E	UNIT #	CT	WT						
100	80	CSC	1	4.4	GLASS		CURVE	LBLUE	EMBOSS	
100	80	CSC	1	23.5	GLASS		BASE	CLEAR	RSB	
100	80	CSC	1	4.7	GLASS		CURVE	MILK		
100	80		1	4.0	URM	PEBL				
100	80	CSC	9	6.5	METAL		FERS			
100	80	CSC	1	5.8	GLASS		CURVE	CLEAR	EMBOSS	
100	85	CSC	4	14.2	GLASS		CURVE	CLEAR		
100	85	CSC	1	2.3	GLASS		CURVE	LBLUE		
100	85	CSC	4	0.4	METAL		FERS			
100	85	CSC	2	1.6	URM	PEBL				
100	85	CSC	1	1.5	URM	PEBL				
100	85	CSC	1	3.5	GLASS		RIM	CLEAR		
100	95	CSC	1	1.3	FOSSI					
100	100	CSC	1	0.5	GLASS		CURVE	CLEAR		
100	100	CSC	1	1.0	METAL		FERS			
100	105	CSC		2.9	METAL		FERS			
100	110	CSC	1	0.5	GLASS		CURVE	MILK		
100	110	CSC		3.7	METAL		FERS			
100	110		1	0.7	POT		BODYFG	PLAIN	SAND	
100	115	CSC	1	1.9	GLASS		MILK	PRESS		
100	115	CSC		1.4	METAL		FERS			
100	125		1	11.7	URM	CHNK	SS			
107	110		1	0.8	CL	FLA	CRT			
		GENE	3	11.1	GLASS		CURVE	MOLD	CLEAR	
		GENE	3	8.7	GLASS		CURVE	CLEAR		
		GENE	1	3.5	GLASS		SQUARE	CLEAR		
		GENE	1	10.4	GLASS		BOTTLE	CLEAR	EMBOSS	
		GENE	1	1.9	GLASS		CURVE	PINK		
		GENE	1	10.3	GLASS		CURVE	LGRN		
		GENE	1	0.3	GLASS		CURVE	COBALT		
		GENE	1	235.5	BRICK					
		GENE	2	10.3	EARTH		WHITE	UNDEC		
		GENE	1	2.0	EARTH		WHITE	RIM		
		GENE	1	13.3	EARTH		WHITE	RIM	BANDED	GREEN
		GENE	1	2.8	STONE		INDUN			
		GENE	1	1.2	SYN		RUBBER			
		GENE	2	7.6	METAL		NAIL			
		GENE	7	6..	METAL		FERS			
			1	1.5	URM	PEBL				
			1	10.2	URM	CHNK	QZIT			
			1	71.5	CL	CORE	MDIR	QZIT		
			1	1.4	CL	FLA	CRT			
			?	3.0	POT		BODYFG	SAND	WEA	
			1	0.8	POT		BODYFG	SHELL	WEA	
		GENE	1	2.0	GLASS		CURVE	CLEAR	MOLD	
		GENE	1	0.7	STONE					
		GENE	1	3.3	STONE		ALBOTH			
			2	1.7	CL	FLA	RUM	CRT		

TABLE C-12
3MS473 ARTIFACTS

N	E	UNIT #	CT	WT					
			2	3.5	POT		BODY	PLAIN	SAND
			1	0.3	POT		BODY	PLAIN	SHELL
			1	0.3	CL	FLA	CRT		
			1	1.2	CL	FLA	CRT		
			1	0.3	CL	FLA	CRT		
			1	0.3	POT		BODYFG	SAND	
			1	0.4	CL	FLA	CRT		
			1	0.4	CL	FLA	CRT		
			1	0.1	CL	FLA	CRT		
			1	5.7	CL	FLA	RIM	CRT	
			2	1.3	POT		BODYFG	PLAIN	SAND
		1X1M 1	1	2.8	METAL				
		1X1M 1	1	0.4	CL	FLA	CRT		
		1X1M 1	1	2.2	CL	FLA	DECORT	CRT	
		1X1M 1	1	0.2	CL	FLA	CRT		

Number of artifacts in printout: 207
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 5:20

TABLE C-13 3MS473 ARTIFACTS FROM TEST UNIT BY DEPTH

```
__N__E_UNIT_#__TOP__BOTTM__CT___WT______________________________
--) SNO = 3MS473
      BDEPTH = 10

97/  102 1X1M 1 1.00   10.00   3   60.0  STONE        BRSBRS

   CT              3.00      3.000          45.00
   WT             60.00     60.000         176.40


   SNO = 3MS473
--)    BDEPTH = 20

       1X1M 1 10.00  20.00   1   2.8   METAL

   CT              1.00      1.000          46.00
   WT              2.80      2.800         179.20


   SNO = 3MS473
--)    BDEPTH = 30

       1X1M 1 20.00  30.00   1   2.2  CL   FLA   DECORT  CRT
       1X1M 1 20.00  30.00   1   0.4  CL   FLA    CRT

   CT              2.00      1.000          48.00
   WT              2.60      1.300         181.80


   SNO = 3MS473
--)    BDEPTH = 40

       1X1M 1 30.00  40.00   1   0.2  CL   FLA    CRT

Variable:     Subtotal:     Mean:     Running total:
     CT            1.00     1.000          49.00
     WT            0.20     0.200         182.00
```

TABLE C-14
3MS472 ARTIFACTS

N	E	UNIT #	CT	WT				
70	100	CSC	2	10.9	BRICK			
70	105	CSC	1	0.3	SHELL			
70	105	CSC	4	21.5	BRICK			
75	100	CSC	1	6.0	GLASS	CURVE	CLEAR	MOLD
75	100	CSC	2	276.7	BRICK			
75	105	CSC	3	4.5	GLASS	CURVE	CLEAR	
80	100	CSC	2	23.2	GLASS	FLAT	CLEAR	
80	100	CSC	1	190.6	BRICK			
80	100	CSC	1	376.9	HLITH	CUT		
80	105	CSC	1	1.6	EARTH	WHITE	RIM	
80	105	CSC	1	4.5	GLASS	CURVE	CLEAR	
80	105	CSC	1	4.3	GLASS	MLID	MILK	
85	100	CSC	1	7.6	GLASS	CURVE	CLEAR	MOLD
85	105	CSC	2	9.5	GLASS	CURVE	LGRN	
85	105	CSC	1	0.7	GLASS	CURVE	BROWN	
85	105	CSC	1	8.4	GLASS	JRIM	CLEAR	
90	105	CSC	1	9.2	GLASS	CURVE	LBLUE	
90	105	CSC	2	2.7	GLASS	FLAT	CLEAR	
95	100	CSC	1	0.3	GLASS	FLAT	LBLUE	
95	100	CSC	1	0.4	GLASS	FLAT	CLEAR	
95	105	FEAT	1	12.1	GLASS	JRIM	CLEAR	
95	105	CSC	1	0.8	GLASS	CURVE	COBALT	
100	50	CSC	1	0.5	EARTH	WHITE		
100	50	CSC	1	8.1	GLASS	JAR	MILK	MOLD
100	50	CSC	2	1.4	GLASS	CURVE	CLEAR	
100	55	CSC	1	5.4	GLASS	JBASE	MILK	MOLD
100	55	CSC	1	28.0	METAL	FERS	METOBJ	
100	60	CSC	1	1.6	EARTH	WHITE		
100	65	CSC	3	7.3	EARTH	WHITE		
100	65	CSC	1	15.9	GLASS	CURVE	LAV	
100	65	CSC	1	7.1	GLASS	BNECK	CLEAR	
100	65	CSC	1	4.1	GLASS	JRIM	CLEAR	
100	65	CSC	1	0.7	GLASS	FLAT	CLEAR	
100	65	CSC	1	1.0	GLASS	FLAT	LGRN	
100	70	CSC	1	1.5	EARTH	WHITE	HANDLE	
100	70	CSC	2	4.7	GLASS	MLID	MILK	
100	70	CSC	1	10.4	GLASS	MILK		
100	70	CSC	1	2.0	GLASS	CLEAR	EMBOSS	
100	70	CSC	3	7.4	GLASS	CLEAR	MOLD	
100	70	CSC	1	0.6	GLASS	CURVE	DBRN	
100	70	CSC	1	1.4	GLASS	FLAT	CLEAR	
100	70	CSC	8	14.4	GLASS	CURVE	CLEAR	
100	70	CSC	1	2.0	METAL	FERS		
100	70	CSC	1	19.9	BRICK			
100	75	CSC	1	3.4	EARTH	WHITE	BASE	
100	75	CSC	1	5.3	EARTH	WHITE		
100	75	CSC	1	1.2	GLASS	CURVE	BLUE	
100	75	CSC	1	1.6	GLASS	MLID	MILK	EMBOSS

TABLE C-14
3MS472 ARTIFACTS

N	E	UNIT #	CT	WT					
100	75	CSC	1	1.7	GLASS	CURVE	MILK		
100	75	CSC	1	6.0	GLASS	CURVE	BROWN		
100	75	CSC	1	4.1	GLASS	CURVE	COBALT		
100	75	CSC	1	32.4	GLASS	BASE	BLUE		
100	75	CSC	3	3.1	GLASS	FLAT	LGRN		
100	75	CSC	3	2.7	GLASS	FLAT	CLEAR		
100	75	CSC	1	10.6	GLASS	CURVE	CLEAR	MOLD	
100	75	CSC	9	16.6	GLASS	CURVE	CLEAR		
100	75	CSC	1	0.5	URM	CANC			
100	75	CSC	1	9.0	STONE	MOLD	COBCOB		
100	75	CSC	1	44.3	BRICK				
100	75	CSC	1	0.8	EUCER	MARBLE			
100	80	CSC	2	3.5	EARTH	WHITE			
100	80	CSC	1	1.0	EARTH	WHITE	MONOG	GREEN	
100	80	CSC	1	4.0	GLASS	CURVE	CLEAR	MOLD	
100	80	CSC	3	1.7	GLASS	CURVE	LBLUE		
100	80	CSC	1	3.4	GLASS	BNECK	CLEAR	THREAD	SLIP
100	80	CSC	2	10.6	GLASS	CURVE	BROWN		
100	80	CSC	2	4.4	GLASS	MLID	MILK		
100	80	CSC	3	2.7	GLASS	FLAT	LBLUE		
100	80	CSC	21	30.4	GLASS	FLAT	CLEAR		
100	80	CSC	12	25.1	GLASS	CURVE	CLEAR		
100	80	CSC	1	0.5	URM	CANC			
100	80	CSC	2	1.7	METAL	FERS			
100	80	CSC	1	20.3	METAL	METOBJ			
100	80	CSC	1	1.3	PORCE				
100	80	CSC	1	200.0	BRICK				
100	85	CSC	8	14.8	GLASS	FLAT	CLEAR		
100	85	CSC	1	8.6	GLASS	BASE	CLEAR	PRESS	
100	85	CSC	4	4.1	GLASS	CURVE	CLEAR		
100	85	CSC	1	3.9	GLASS	CURVE	LBLUE		
100	85	CSC	1	9.9	GLASS	BASE	BLUE		
100	85	CSC	3	3.6	GLASS	FLAT	LGRN		
100	85	CSC	1	232.6	METAL	FERS	PIPE		
100	85	CSC	1	0.9	PORCE				
100	85	CSC	2	6.8	BRICK				
100	90	CSC	1	0.3	EARTH	WHITE	MONOG	GREEN	
100	90	CSC	1	1.5	GLASS	CURVE	BROWN		
100	90	CSC	1	4.1	GLASS	CURVE	LBLUE		
100	90	CSC	6	6.4	GLASS	CURVE	CLEAR		
100	90	CSC	1	385.7	METAL	FERS	STOVE		
100	90	CSC	1	0.6	METAL	FERS			
100	90	CSC	1	2.0	METAL	NAIL	WIRE		
100	90	CSC	3	200.5	BRICK	FR			
100	95	CSC	2	3.6	EARTH	WHITE			
100	95	CSC	1	5.4	GLASS	CURVE	BLUE		
100	95	CSC	1	7.3	GLASS	CURVE	MILK		
100	95	CSC	1	1.1	GLASS	MILK			

TABLE C-14

3MS472 ARTIFACTS

N	E	UNIT #	CT	WT				
100	95	CSC	1	4.9	GLASS	BNECK	LGRN	
100	95	CSC	4	6.5	GLASS	CURVE	CLEAR	
100	95	CSC	3	6.7	GLASS	CURVE	CLEAR	
100	95	CSC	1	72.5	STONE	CHURN	ALBUN	
100	100	CSC	1	2.2	EARTH	WHITE		
100	100	CSC	1	4.7	GLASS	RIM	MILK	
100	105	CSC	1	3.3	GLASS	CURVE	LGRN	
100	105	CSC		0.1	SYN	PLAST		
100	110	CSC	1	2.4	EARTH	WHITE		
100	110	CSC	1	1.5	EARTH	WHITE		
100	110	CSC	1	4.7	GLASS	CURVE	CLEAR	
100	115	CSC	4	3.0	GLASS	FLAT	CLEAR	
100	115	CSC	1	30.8	GLASS	BBASE	EMBOSS	
100	115	CSC	2	2.9	GLASS	CURVE	CLEAR	
100	115	CSC	2	1.9	GLASS	FLAT	LGRN	
100	115	CSC	1	1.1	URM	CANC		
100	115	CSC	1	3.2	STONE			
100	115	CSC	1	32.2	BRICK			
100	125	CSC	1	0.7	GLASS	CURVE	CLEAR	MOLD
100	125	CSC	1	0.4	GLASS	CURVE	LAV	
105	50	CSC	1	4.3	EARTH	WHITE		
105	50	CSC	1	12.0	GLASS	JBASE	CLEAR	
105	55	CSC	2	2.6	GLASS	CURVE	CLEAR	MOLD
105	60	CSC	2	6.8	GLASS	CURVE	DBRN	
105	60	CSC	1	1.3	GLASS	FLAT	CLEAR	
105	65	CSC	2	2.3	GLASS	FLAT	CLEAR	
105	65	CSC	4	34.9	GLASS	CURVE	CLEAR	
105	65	CSC	1	9.4	GLASS	BASE	LGRN	
105	65	CSC	1	2.0	GLASS	CURVE	LBLUE	
105	65	CSC	1	3.7	GLASS	CURVE	CLEAR	MOLD
105	70	CSC	4	11.1	EARTH	WHITE		
105	70	CSC	1	2.9	GLASS	BRIM	CLEAR	
105	70	CSC	1	4.6	GLASS	CURVE	RIM	PINK
105	70	CSC	1	1.4	GLASS	CURVE	DBRN	
105	70	CSC	1	2.7	GLASS	MLID	MILK	
105	70	CSC	1	1.4	GLASS	CURVE	CLEAR	MOLD
105	70	CSC	2	2.9	GLASS	FLAT	CLEAR	
105	70	CSC	5	14.5	GLASS	CURVE	CLEAR	
105	70	CSC	1	4.0	GLASS	CURVE	LAV	MOLD
105	70	CSC	1	1.8	GLASS	FLAT	LGRN	
105	70	CSC	1	21.4	METAL	FERS		
105	70	CSC	2	0.8	SYN	PLAST		
105	75	CSC	2	8.2	EARTH	WHITE		
105	75	CSC	1	10.8	EARTH	BRSOTH	LBLUE	
105	75	CSC	1	2.6	GLASS	CURVE	DBRN	
105	75	CSC	1	13.5	GLASS	PLATE	MILK	MOLD
105	75	CSC	1	3.5	GLASS	CURVE	LBLUE	MOLD
105	75	CSC	8	18.0	GLASS	CURVE	CLEAR	

TABLE C-14
3MS472 ARTIFACTS

N	E	UNIT #	CT	WT				
105	75	CSC	1	1.4	GLASS	FLAT	CLEAR	
105	75	CSC	1	0.9	GLASS	CURVE	COBALT	
105	75	CSC	3	4.5	GLASS	CURVE	LGRN	
105	75	CSC	5	127.1	METAL	METOBJ		
105	75	CSC	1	270.1	MORTA			
105	80	CSC	1	5.4	EARTH	WHITE		
105	80	CSC	2	3.5	EARTH	WHITE	RIM	
105	80	CSC	2	2.3	GLASS	MLID	MILK	
105	80	CSC	1	2.0	GLASS	CURVE	COBALT	
105	80	CSC	1	2.7	GLASS	BRIM	CLEAR	STOPPE
105	80	CSC	5	7.3	GLASS	FLAT	CLEAR	
105	80	CSC	4	4.7	GLASS	CURVE	CLEAR	
105	80	CSC	4	9.5	GLASS	CURVE	CLEAR	MOLD
105	85	CSC	7	15.4	GLASS	CURVE	CLEAR	
105	85	CSC	7	8.9	GLASS	FLAT	CLEAR	
105	85	CSC	1	7.0	GLASS	JRIM	CLEAR	
105	85	CSC	1	5.0	PORCE			
105	85	CSC	4	241.6	BRICK	FR		
105	90	CSC	2	2.8	GLASS	FLAT	CLEAR	
105	90	CSC	1	3.8	GLASS	CURVE	CLEAR	
105	90	CSC	2	215.6	BRICK	FR		
105	95	CSC	1	1.4	EARTH	WHITE		
105	95	CSC	1	3.8	GLASS	CURVE	LGRN	
105	100	CSC	1	0.7	GLASS	FLAT	CLEAR	
105	100	CSC	1	3.4	GLASS	CURVE	CLEAR	MOLD
105	105	CSC	1	2.3	EARTH	WHITE		
105	105	CSC	1	1.3	GLASS	FLAT	CLEAR	
105	110	CSC	1	75.7	GLASS	JBASE	CLEAR	
105	110	CSC	1	2.9	GLASS	CURVE	LGRN	
105	110	CSC	1	163.4	STONE	BASE	CROCK	BRSBRS
105	110	CSC	1	30.2	BRICK	FR		
105	115	CSC	1	35.0	GLASS	BASE	CLEAR	
105	115	CSC	1	16.6	GLASS	JRIM	CLEAR	
105	115	CSC	1	60.3	METAL	STOVE		
105	120	CSC	1	0.9	GLASS	FLAT	CLEAR	
105	120	CSC	2	7.6	GLASS	CURVE	CLEAR	
105	120	CSC	1	112.8	METAL	STOVE		
105	125	CSC	1	2.7	GLASS	NECK	COBALT	
105	125	CSC	1	220.1	METAL	STOVE		
105	135	CSC	1	3.4	EARTH	WHITE		
110	100	CSC	1	1.8	EARTH	WHITE		
110	100	CSC	1	137.2	BRICK			
115	100	CSC	1	0.2	GLASS	CURVE	BLUE	
115	100	CSC	1	103.2	METAL	FERS	METOBJ	
115	105	CSC	1	36.3	BRICK			
120	100	CSC	1	3.5	EARTH	WHITE	RIM	RTREAT MOLD
		GENE	3	9.7	EARTH	WHITE		
		GENE	1	1.0	EARTH	WHITE	HANDLE	

TABLE C-14
3MS472 ARTIFACTS

N	E	UNIT #	CT	WT					
		GENE	1	3.3	EARTH	WHITE	RIM	MOLD	FLOW
		GENE	1	0.2	GLASS	CURVE	COBALT		
		GENE	1	13.6	GLASS	JAR	MILK		
		GENE	2	4.0	GLASS	MLID	MILK		
		GENE	1	0.3	GLASS	CURVE	CLEAR		
		GENE	1	7.6	GLASS	JRIM	LBLUE		
		GENE	1	9.5	GLASS	BBASE	CLEAR	SBASAL	
		GENE	1	2.8	GLASS	BRIM	CLEAR	SLIP	
		GENE	2	28.0	STONE	MOLD	COBBRS		
		GENE	1	3.0	PORCE	INSUL			
		GENE	1	1093.5	BRICK	MARPAR			

Number of artifacts in printout: 203
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 0:5

TABLE C-15

3MS472 ARTIFACTS FROM TEST UNIT BY DEPTH

\#

MINARK D.B.S. V4.0

Database name: ARTFORM
This retrieval performed: 16Apr87 5:20
Data last updated: 16Apr87 1:55
Total artifacts in database with data: 3668
\# of artifacts excluded by security rating: 0

Subset name: 472TU # of artifacts in subset: 22

Cumulative selection criteria:
SNO = 3MS472 ;
UNIT = 1X1M ;

All artifacts selected

1X1M	1	0.00	10.00	1	4.0	BRICK				
1X1M	1	0.00	10.00	5	6.9	GLASS	CURVE	CLEAR		
1X1M	1	0.00	10.00	1	4.3	EARTH	WHITE	RIM		
1X1M	1	0.00	10.00	2	1.4	GLASS	CURVE	LBLUE		
1X1M	1	0.00	10.00	1	3.5	GLASS	MLID	MILK		
1X1M	1	0.00	10.00	1	0.7	EARTH	WHITE			
1X1M	1	0.00	10.00	2	1.7	GLASS	CURVE	MOLD	CLEAR	
	CT		13.00		1.857		13.00			
	WT		22.50		3.214		22.50			

1X1M	1	10.00	20.00	2	3.7	GLASS	MLID	MILK
1X1M	1	10.00	20.00	1	1.1	EARTH	WHITE	RIM
1X1M	1	10.00	20.00	2	5.0	EARTH	WHITE	
1X1M	1	10.00	20.00	1	5.8	METAL		
1X1M	1	10.00	20.00	1	1.7	GLASS	FLAT	CLEAR
1X1M	1	10.00	20.00	4	10.3	GLASS	CURVE	CLEAR
1X1M	1	10.00	20.00	1	1.1	OHIST	GRAPH	
	CT		12.00		1.714		25.00	
	WT		28.70		4.100		51.20	

TABLE C-15
3MS472 ARTIFACTS FROM TEST UNIT BY DEPTH

UNIT	#	TOP	BOTTM	CT	WT			
1X1M	1	20.00	30.00	2	3.9	GLASS	CURVE	CLEAR
1X1M	1	20.00	30.00	1	1.2	GLASS	FLAT	CLEAR
1X1M	1	20.00	30.00	9	47.3	METAL	FERS	
1X1M	1	20.00	30.00	1	2.3	BRICK	FR	

CT	13.00	3.250	38.00
WT	54.70	13.675	105.90

1X1M	1	30.00	40.00	1	2.3	GLASS	FLAT	CLEAR
1X1M	1	30.00	40.00	1	4.7	GLASS	CURVE	CLEAR
1X1M	1	30.00	40.00	1	2.0	GLASS	BASE	CLEAR
1X1M	1	30.00	40.00	1	1.5	EARTH	WHITE	RIM

Number of artifacts in printout: 22
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 5:20

TABLE C-16
3MS478 ARTIFACTS

N	E	UNIT	#	CT	WT					
50	105	CSC		1	0.7	GLASS	CURVE	CLEAR		
55	100	CSC		1	0.5	GLASS	FLAT	CLEAR		
60	100	CSC		1	97.6	METAL	FERS	METOBJ		
60	105	CSC		1	6.3	GLASS	JLID	CLEAR	MOLD	
65	100	CSC		1	0.6	BRICK				
65	100	CSC		1	18.2	GLASS	BASE	BLUE	SBASAL	
65	105	CSC		2	3.7	GLASS	CURVE	LBLUE		
75	100	CSC			91.1	BRICK				
75	100	CSC		1	1.3	EARTH	WHITE	BODY		
85	100	CSC		1	2.1	GLASS	CURVE	CLEAR		
85	100	CSC		1	0.4	GLASS	CLEAR			
85	100	CSC		1	4.3	GLASS	BNECK	CLEAR	THREAD	SLIP
85	100	CSC		1	18.4	GLASS	JLID	CLEAR	EMBOSS	
85	105	CSC		1	1.4	GLASS	CURVE	CLEAR		
85	105	CSC		1	0.9	PORCE				
85	105	CSC		1	0.8	GLASS	CURVE	MILK		
85	105	CSC		1	9.5	BRICK				
90	100	CSC		2	306.4	BRICK				
90	100	CSC		1	3.2	GLASS	FLAT	CLEAR		
90	100	CSC		1	0.9	GLASS	CURVE	CLEAR		
90	100	CSC		1	3.9	GLASS	CURVE	CLEAR	MOLD	
90	105	CSC		2	0.9	GLASS	CURVE	CLEAR		
95	70	CSC		1	6.8	EARTH	WHITE	BASE	MARPAR	
95	70	CSC		2	3.7	EARTH	WHITE	BODY		
95	70	CSC		1	4.8	GLASS	FLAT	CLEAR		
95	70	CSC		1	1.0	GLASS	CURVE	CLEAR		
95	70	CSC		1	8.5	BRICK				
95	70	CSC		1	1.8	METAL	LEAD	METOBJ		
95	70	CSC		1	0.5	FOSSI	IND			
95	70	CSC		1	0.3	URM	CANC			
95	70	CSC		1	6.9	METAL	MELT			
95	75	CSC		1	0.8	EARTH	WHITE	BODY	DECAL	
95	75	CSC		1	3.4	EARTH	WHITE	BODY		
95	75	CSC		1	4.7	STONE	ALBALB			
95	75	CSC		1	2.1	GLASS	FLAT	LID	MILK	
95	75	CSC		5	4.8	GLASS	FLAT	CLEAR		
95	75	CSC		5	6.2	GLASS	SQUARE	CLEAR		
95	75	CSC		3	7.4	GLASS	CURVE	CLEAR		
95	80	CSC		1	5.4	GLASS	JNECK	CLEAR		
95	80	CSC		1	1.4	GLASS	FLAT	CLEAR	MOLD	
95	80	CSC		7	37.6	GLASS	CURVE	CLEAR		
95	80	CSC		4	9.0	GLASS	FLAT	CLEAR		
95	80	CSC		1	3.3	EARTH	WHITE	BODY		
95	80	CSC		1	4.0	GLASS	LID	MILK		
95	80	CSC		1	1.2	EARTH	WHITE	RIM	MOLD	
95	80	CSC		1	2.5	EARTH	WHITE	BASE		
95	80	CSC		4	2.1	URM	CANC			
95	80	CSC		1	3.2	FOSSI	IND			

TABLE C-16
3MS478 ARTIFACTS

N	E	UNIT #	CT	WT				
95	80	CSC	1	0.9	URM	CONC		
95	80	CSC	4	12.2	METAL	METOBJ		
95	85	CSC	1	15.7	GLASS	BASE	BLUE	
95	85	CSC	1	3.0	GLASS	JRIM	BROWN	
95	85	CSC	1	1.0	GLASS	JRIM	MILK	
95	85	CSC	4	6.0	GLASS	FLAT	CLEAR	
95	85	CSC	6	14.6	GLASS	CURVE	CLEAR	
95	85	CSC	2	13.5	EARTH	WHITE	BODY	
95	85	CSC	1	1.6	EARTH	WHITE	RIM	
95	85	CSC	2	7.1	METAL	FERS		
95	85	CSC	2	1.3	FOSSI	IND		
95	85	CSC	3	80.2	BRICK			
95	90	CSC	1	88.6	METAL	FILE		
95	90	CSC	1	2.1	EARTH	WHITE	BASE	
95	90	CSC	1	5.0	GLASS	CURVE	BROWN	
95	90	CSC	7	11.4	GLASS	CURVE	CLEAR	
95	90	CSC	1	0.7	GLASS	CURVE	LGRN	
95	90	CSC	4	5.7	GLASS	FLAT	CLEAR	
95	90	CSC	1	5.6	GLASS	CURVE	MILK	MOLD
95	90	CSC	1	0.9	GLASS	JLID	MILK	
95	90	CSC	1	4.1	GLASS	BNECK	CLEAR	SLIP
95	90	CSC	1	14.2	GLASS	BASE	CLEAR	
95	90	CSC	2	1.0	FOSSI	IND		
95	90	CSC	4	381.5	BRICK			
95	95	CSC	1	10.3	BRICK			
95	95	CSC	2	0.9	METAL	FERS		
95	95	CSC	2	6.6	EARTH	WHITE	BODY	
95	95	CSC	1	3.6	EARTH	WHITE	RIM	
95	95	CSC	1	0.5	URM	CANC		
95	95	CSC	3	4.0	GLASS	CURVE	CLEAR	
95	95	CSC	1	8.3	GLASS	JNECK	CLEAR	MOLD
95	95	CSC	1	0.7	GLASS	CURVE	CLEAR	MOLD
95	95	CSC	1	7.0	GLASS	RIM	MILK	
95	95	CSC	1	5.1	GLASS	MARBLE	CPOLY	
95	100	CSC	5	7.7	GLASS	CURVE	CLEAR	
95	100	CSC	1	3.7	GLASS	CURVE	LGRN	
95	100	CSC	2	154.0	BRICK			
95	100	CSC	1	0.9	LEATH	SHOE		
95	100	CSC	1	7.1	GLASS	RIM	MILK	
95	100	CSC	1	1.2	GLASS	FLAT	LID	MILK
95	100	CSC	1	18.2	METAL	HANDLE		
95	100	CSC	5	6.8	METAL	IND	METOBJ	
95	100	CSC	2	1.7	GLASS	FLAT	CLEAR	
95	105	CSC	1	7.8	GLASS	SQUARE	CLEAR	
95	105	CSC	3	6.8	GLASS	CURVE	CLEAR	
95	105	CSC	1	3.4	GLASS	CURVE	CLEAR	EMBOSS
95	105	CSC	1	5.5	URM	JLID	MILK	MOLD
95	105	CSC	1	2.0	GLASS	JLID	MILK	EMBOSS

TABLE C-16
3MS478 ARTIFACTS

N	E	UNIT #	CT	WT						
95	105	CSC	1	1.0	EUCER		IND			
95	110	CSC	1	1.5	GLASS		CURVE	CLEAR		
95	110	CSC	1	2.3	EARTH		WHITE	BODY	MOLD	
95	115	CSC	2	3.3	GLASS		CURVE	CLEAR		
95	115	CSC	1	1.8	GLASS		JLID	MILK		
95	115	CSC	1	1.2	GLASS		JLID	MILK	EMBOSS	
95	115	CSC	1	1.9	EARTH		WHITE	BODY	MOLD	
95	125	CSC	1	68.5	BRICK					
95	130	CSC	1	1.2	EARTH		WHITE	BODY	MOLD	HPAINT
100	70	CSC	1	1.5	GLASS		CURVE	CLEAR		
100	70	CSC	1	1.8	GLASS		JNECK	BLUE		
100	70	CSC	1	7.0	GLASS		CURVE	BROWN		
100	70	CSC	1	1.7	GLASS		SQUARE	CLEAR		
100	70	CSC	1	3.3	GLASS		LID	MILK		
100	70	CSC	2	18.2	BRICK					
100	70	CSC	1	4.7	METAL		BARBWI			
100	75	CSC	2	2.9	GLASS		MLID	MILK		
100	75	CSC	1	6.3	GLASS		JBASE	MILK	MOLD	
100	75	CSC	2	1.4	GLASS		FLAT	CLEAR		
100	75	CSC	6	10.0	GLASS		CURVE	CLEAR		
100	75	CSC	1	1.0	GLASS		CURVE	LBLUE		
100	75	CSC	1	2.1	GLASS		CURVE	GREEN		
100	75	CSC	1	5.2	GLASS		CURVE	COBALT		
100	75	CSC	1	3.7	GLASS		CURVE	BROWN		
100	75	CSC	1	326.9	METAL		FERS	STOVE		
100	75	CSC	2	2.5	METAL		FERS	METOBJ		
100	75	CSC	2	5.4	BRICK					
100	75	CSC	2	1.5	FOSSI		IND			
100	75	CSC	1	0.4	URM		CANC			
100	75	CSC	1	17.5	URM	CHNK	LS			
100	80	CSC	9	12.8	GLASS		FLAT	CLEAR		
100	80	CSC	8	18.2	GLASS		CURVE	CLEAR		
100	80	CSC	1	5.8	GLASS		CURVE	LGRN		
100	80	CSC	1	1.2	GLASS		BNECK	COBALT	THREAD	
100	80	CSC	1	1.8	GLASS		JLID	MILK	MOLD	EMBOSS
100	80	CSC	1	7.9	GLASS		CLEAR	PRESS		
100	80	CSC	1	13.6	GLASS		BASE	CLEAR		
100	80	CSC	1	5.0	BRICK					
100	80	CSC	1	1.1	MORTA					
100	80	CSC	1	3.7	URM	CHNK	CRT			
100	80	CSC	2	17.6	METAL		NAIL			
100	80	CSC	1	3.5	EARTH		WHITE	BODY		
100	85	CSC	2	2.5	SYN		RUBBER			
100	85	CSC	7	180.7	METAL		METOBJ			
100	85	CSC	3	42.5	BRICK					
100	85	CSC	3	8.4	EARTH		WHITE	BODY		
100	85	CSC	2	18.9	EARTH		WHITE	RIM	MOLD	
100	85	CSC	7	10.1	GLASS		FLAT	CLEAR		

TABLE C-16
3MS478 ARTIFACTS

N	E	UNIT #	CT	WT						
100	85	CSC	1	0.7	GLASS	RIM	CLEAR			
100	85	CSC	3	5.4	GLASS	CURVE	CLEAR			
100	85	CSC	1	2.5	GLASS	SQUARE	CLEAR			
100	85	CSC	1	6.4	GLASS	JNECK	CLEAR	MOLD		
100	85	CSC	1	18.9	GLASS	BBASE	BODY	MOLD	EMBOSS	
100	85	CSC	1	2.5	GLASS	JLID	MILK	EMBOSS		
100	85	CSC	1	1.7	EARTH	WHITE	FIG	POVER		
100	85	CSC	1	1.8	GLASS	CURVE	CLEAR	MOLD		
100	90	CSC	5	39.2	BRICK					
100	90	CSC	4	5.8	GLASS	FLAT	CLEAR			
100	90	CSC	1	1.1	GLASS	CURVE	CLEAR			
100	90	CSC	2	4.7	GLASS	SQUARE	CLEAR			
100	90	CSC	1	0.5	GLASS	CLEAR				
100	90	CSC	1	1.5	GLASS	BASE	CLEAR	EMBOSS	SBASAL	
100	90	CSC	1	27.9	GLASS	BBASE	CLEAR	PRESS		
100	90	CSC	1	1.1	GLASS	CURVE	BROWN	MOLD		
100	90	CSC	1	6.[illegible]	EARTH	WHITE	BODY			
100	90	CSC	1	1.5	EARTH	WHITE	RIM			
100	95	CSC	3	38.7	BRICK					
100	95	CSC	1	0.7	FOSSI	IND				
100	95	CSC	1	0.8	METAL	FERS				
100	95	CSC	2	1.9	GLASS	FLAT	CLEAR			
100	95	CSC	1	1.2	GLASS	CURVE	CLEAR			
100	95	CSC	1	0.9	GLASS	FLAT	CLEAR	MOLD		
100	95	CSC	1	0.7	GLASS	CURVE	CLEAR	MOLD		
100	95	CSC	1	3.0	GLASS	CURVE	MILK	MOLD		
100	95	CSC	2	2.6	GLASS	CURVE	MILK			
100	95	CSC	1	27.7	BRICK	MARPAR				
100	100	CSC	2	11.4	GLASS	BBASE	CLEAR			
100	100	CSC	1	1.5	GLASS	SQUARE	CLEAR			
100	100	CSC	1	19.6	GLASS	FLAT	CLEAR			
100	100	CSC	1	5.4	GLASS	RIM	MILK			
100	100	CSC	1	20.8	GLASS	JRIM	CLEAR			
100	100	CSC	1	2.3	GLASS	CURVE	GREEN			
100	100	CSC	2	3.3	GLASS	CURVE	CLEAR	MOLD		
100	100	CSC	5	3.1	GLASS	CURVE	CLEAR			
100	100	CSC	2	109.0	BRICK					
100	105	CSC	1	6.4	GLASS	SQUARE	CLEAR			
100	105	CSC	1	33.5	GLASS	BNECK	CLEAR	MOLD	SLIP	
100	110	CSC	1	0.1	GLASS	MILK				
100	110	CSC	1	6.0	GLASS	BASE	CLEAR	SBASAL	EMBOSS	OCTAG
100	115	CSC	1	0.1	URM	CANC				
100	115	CSC	1	9.3	GLASS	CURVE	CLEAR			
100	120	CSC	1	2.2	GLASS	BASE	CLEAR	MOLD		
100	125	CSC	1	2.2	GLASS	FLAT	CLEAR			
100	125	CSC	1	1.9	GLASS	CURVE	CLEAR			
100	130	CSC	1	1.3	EARTH	WHITE	BODY			
100	130	CSC	1	3.9	EARTH	WHITE	BODY	DECAL		

TABLE C-16
3MS478 ARTIFACTS

N	E	UNIT #	CT	WT				
100	140	CSC	1	2.6	EARTH	WHITE	BODY	
100	145	CSC	1	15.9	SYN	RUBBER	TIRE	
105	70	CSC	1	6.0	METAL	FERS	METOBJ	
105	70	CSC	1	4.0	URM	CANC		
105	70	CSC	2	0.0	GLASS	CURVE	CLEAR	
105	70	CSC	1	5.0	GLASS	BASE	CLEAR	MOLD
105	70	CSC	1	4.0	GLASS	CURVE	COBALT	
105	70	CSC	1	1.0	PORCE	FIG	MOLD	
105	75	CSC	4	11.0	GLASS	FLAT	CLEAR	
105	75	CSC	1	1.2	GLASS	CURVE	BLUE	
105	75	CSC	1	3.2	GLASS	CURVE	CLEAR	
105	75	CSC	1	2.0	EARTH	WHITE	RIM	
105	75	CSC	1	1.2	URM	CANC		
105	75	CSC	1	0.9	PORCE	TABLE		
105	80	CSC	12	31.6	GLASS	CURVE	CLEAR	
105	80	CSC	3	5.0	GLASS	FLAT	CLEAR	
105	80	CSC	3	12.2	GLASS	MLID	MILK	
105	80	CSC	1	1.8	GLASS	CURVE	MILK	
105	80	CSC	1	0.6	GLASS	JRIM	CLEAR	STL
105	80	CSC	4	12.6	EARTH	WHITE	BODY	
105	80	CSC	1	1.6	EARTH	WHITE	RIM	
105	80	CSC	1	4.4	EARTH	WHITE	RIM	BANDED
105	80	CSC	1	3.7	GLASS	MARBLE		
105	80	CSC	3	2.1	METAL	FERS	METOBJ	
105	80	CSC	1	0.1	GLASS	CURVE	BROWN	
105	85	CSC	1	3.6	GLASS	BBASE	CLEAR	SBASAL
105	85	CSC	1	28.3	GLASS	BBASE	CLEAR	EMBOSS
105	85	CSC	1	4.6	GLASS	BASE	CLEAR	SBASAL
105	85	CSC	4	5.0	GLASS	CURVE	CLEAR	MOLD
105	85	CSC	1	3.6	GLASS	CURVE	PINK	
105	85	CSC	8	14.3	GLASS	CURVE	CLEAR	
105	85	CSC	10	17.1	GLASS	FLAT	CLEAR	
105	85	CSC	1	5.6	GLASS	MARBLE	POLY	
105	85	CSC	1	0.3	GLASS	BEAD	YELLOW	
105	85	CSC	1	0.3	GLASS	MLID	MILK	EMBOSS
105	85	CSC	1	13.5	PORCE	INSUL		
105	85	CSC	2	2.5	EARTH	WHITE	RIM	
105	85	CSC	4	4.4	EARTH	WHITE	BODY	
105	85	CSC	1	1.3	SYN	RUBBER		
105	85	CSC	1	3.5	METAL	FERS	BUTTON	
105	85	CSC	2	4.0	METAL	IND		
105	85	CSC	7	81.3	BRICK			
105	90	CSC	1	2.8	EARTH	WHITE	RIM	FLOW
105	90	CSC	1	1.3	EARTH	WHITE	BODY	FLOW
105	90	CSC	1	4.3	EARTH	WHITE	BODY	MOLD
105	90	CSC	1	25.6	GLASS	BNECK	CLEAR	STL
105	90	CSC	3	0.9	GLASS	CURVE	CLEAR	
105	90	CSC	5	6.1	GLASS	FLAT	CLEAR	

TABLE C-16
3MS478 ARTIFACTS

N	E	UNIT #	CT	WT					
105	90	CSC	2	1.7	GLASS		CLEAR		
105	90	CSC	1	205.9	METAL		FERS	METOBJ	
105	90	CSC	1	6.8	BRICK				
105	90	CSC	1	2.7	FOSSI		IND		
105	95	CSC	6	8.9	GLASS		CURVE	CLEAR	
105	95	CSC	1	8.4	GLASS		CURVE	MILK	
105	95	CSC	1	2.5	GLASS		BASE	CLEAR	MOLD
105	95	CSC	4	6.7	EARTH		WHITE	BODY	
105	95	CSC	1	0.6	EARTH		WHITE	BODY	MONOG
105	95	CSC	1	1.0	URM		CANC		
105	100	CSC	10	26.0	GLASS		CURVE	CLEAR	
105	100	CSC	1	2.1	GLASS		FLAT	CLEAR	
105	100	CSC	1	1.7	EARTH		WHITE	RIM	
105	100	CSC	1	138.2	BRICK				
105	105	CSC	1	0.7	GLASS		CURVE	CLEAR	
110	100	CSC	2	4.8	GLASS		SQUARE	CLEAR	
110	100	CSC	1	3.8	GLASS		BRIM	SQUARE	CLEAR
110	100	CSC	1	5.6	GLASS		CURVE	CLEAR	MOLD
110	100	CSC	1	2.2	GLASS		CURVE	MILK	
110	100	CSC	3	109.8	BRICK				
110	105	CSC	1	8.1	PORCE		TABLE		
110	105	CSC	1	1.2	EARTH		WHITE	BODY	MOLD
110	105	CSC	1	9.6	GLASS		JNECK	CLEAR	MOLD
115	100	CSC	1	1.2	BRICK				
115	100	CSC	2	2.2	GLASS		FLAT	CLEAR	
115	100	CSC	1	3.6	GLASS		RIM	MILK	
115	100	CSC	1	1.3	EARTH		WHITE	RIM	
115	105	CSC	1	0.8	GLASS		CURVE	CLEAR	
125	100	CSC	1	1.3	METAL		FERS		
125	100	CSC	1	1.9	GLASS		CURVE	CLEAR	
125	105	CSC	1	21.6	BRICK				
125	105	CSC	2	1.7	EARTH		WHITE	BODY	
125	105	CSC	4	3.4	GLASS		FLAT	CLEAR	
125	105	CSC	1	3.2	GLASS		SQUARE	CLEAR	
125	105	CSC	1	1.5	GLASS		CURVE	CLEAR	
125	105	CSC	1	6.3	GLASS		BASE	CLEAR	
125	105	CSC	1	0.7	GLASS		CURVE	BROWN	EMBOSS
130	100	CSC	1	4.2	METAL		METOBJ		
130	100	CSC	1	17.6	METAL		NUTBOL		
130	100	CSC	1	3.5	GLASS		BNECK	LGRN	THREAD
130	100	CSC	1	0.5	GLASS		CURVE	CLEAR	
130	105	CSC	1	3.2	GLASS		CURVE	CLEAR	
130	105	CSC	1	0.5	METAL		FERS		
135	100	CSC	2	1.5	GLASS		CURVE	BROWN	
135	100	CSC	1	2.6	METAL		FERS		
135	100	CSC	1	0.8	URM	CHNK	IND		
135	105	CSC	1	2.1	GLASS		CURVE	CLEAR	
135	105	CSC	1	1.7	GLASS		CURVE	MILK	

TABLE C-16
3MS478 ARTIFACTS

N	E	UNIT	#	CT	WT				
140	109	CSC		1	0.3	GLASS	CURVE	BROWN	
140	130	CSC		2	3.1	GLASS	CURVE	BROWN	MOLD
		1X1M	1	1	1.4	GLASS	CURVE	CLEAR	
		1X1M	1	1	2.1	EARTH	WHITE	BODY	
		1X1M	1	1	2.0	GLASS	CURVE	CLEAR	EMBOSS

Number of artifacts in printout: 293
# of artifacts excluded by security rating: 0

Output completed: 16Apr87 5:20

TABLE C-17   3MS478 ARTIFACTS FROM TEST UNIT BY DEPTH

```
_N__E_UNIT_#_TOP__BOTTM__CT___WT_____________________________
—) SNO = 3MS478
     BDEPTH = 10

      1X1M 1 1.00   10.00   1    2.1   EARTH      WHITE  BODY
      1X1M 1 0.00   10.00   1    1.4   GLASS      CURVE  CLEAR

   CT          2.00      1.000         113.00
   WT          3.50      1.750         376.00


   SNO = 3MS478
—)    BDEPTH = 30

      1X1M 1 20.00  30.00   1    2.0   GLASS      CURVE  CLEAR  EMBOSS


   CT          1.00      1.000         114.00
   WT          2.00      2.000         378.00


   SNO = 3MS478
      BDEPTH = 30
```

3MSA76 ARTIFACTS RECOVERED

TABLE C-10

N	E	UNIT #	CT	WT						
		CSC	3	1.5	CL	FLA	CRT			
		CSC	1	2.2	CL	SHAT	CRT			
		CSC	1	4.8	POT		BODY	DEC	SAND	WEA
		CSC	23	45.3	POT		BODY	PLAIN	SAND	
		CSC	6	10.6	POT		BODY	DEC	SAND	WEA
		CSC	6	9.3	POT		BODY	PLAIN	SAND	
		CSC	2	6.8	POT		DAUB			
		CSC		21.1	POT		BODYFG	PLAIN	SAND	
		CSC	2	16.8	URM	CHNK				

Number of artifacts in printout: 9
# of artifacts excluded by security rating: 0

Output completed: 26Sep85 0:3

APPENDIX D

Lithologic Descriptions and Grain Size Analysis of Cores, Pits, and Outcrops

Air Strip Core

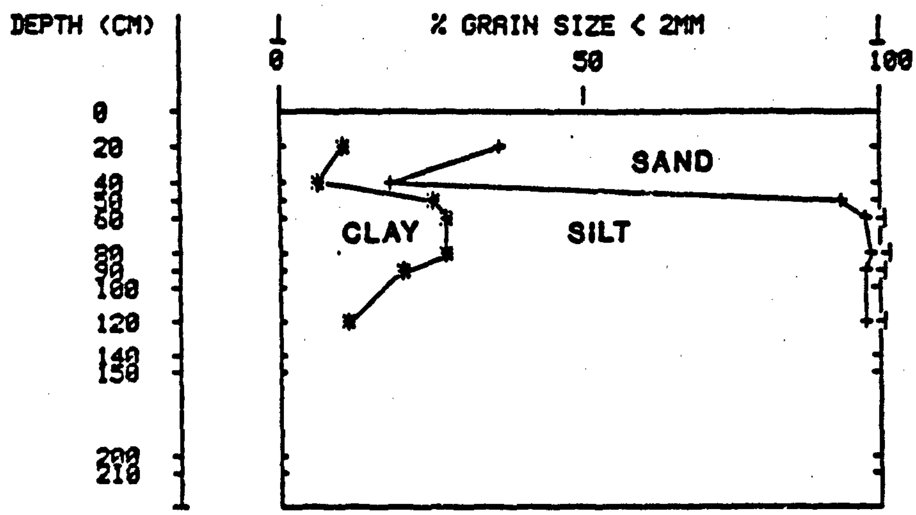
Location: NE¼, NE¼, SW¼, Sec 29, T16N, R11E, Mississippi County, Arkansas (Blytheville 7½ minute Quadrangle)

Geomorphic Position: Pemiscot Bayou point bar

Elevation: 249 feet (75.9 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-18	18	Ap	Natural levee, Pemiscot Bayou	Sandy loam, (10YR 4/2) with few indistinct brown (10YR 3/3) mottles, very weak medium subangular blocky structure, sharp lower contact.
18-33	15	A		Sandy loam with lense of loamy sand at 18-21 cm, dark grayish brown (10YR 4/2), bedded, very sharp lower contact.
33-43	10	C		Loamy sand, light yellowish brown (10YR 6/4), massive, Mn concretions along sharp lower contact.
43-56	13	2ABgb	Backswamp, Mississippi River	Silt loam, dark gray (10YR 4/1), moderate fine subangular blocky.
56-87	31	2Bwgb		Silty clay loam, gray (10YR 5/1) with large yellowish brown (10YR 5/6) mottles, weak medium subangular blocky structure.
87-150	63	3Cg1	Backswamp & Upper point bar, Pemiscot Bayou	Silt loam with very fine sand increasing in lower 23 cm, gray (10YR 5/1) with yellowish brown (10YR 5/4) mottles, massive.
150-205+	55+	3Cg2		Heavy silt loam, gray (10YR 5/1), massive.

AIR STRIP CORE



AIR STRIP CORE

Depth (cm)	SAMPLE	HORIZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY
12	16/5/86-8	Ap	62	26	11	0	0	3	17	28	15	18	6	2	11
38	16/5/86-9	C	82	12	7	0	0	1	7	50	24	7	4	1	7
50	16/5/86-10	2ABgb	5	68	26	0	0	0	1	2	2	22	35	11	26
80	16/5/86-11	2Bwgb	2	70	28	0	0	0	1	1	1	25	34	11	28
114	16/5/86-12	3Cg1	2	71	28	0	0	0	0	1	1	38	25	8	28
131	16/5/86-13	3Cg1	2	77	21	0	0	0	0	0	1	55	17	5	21
203	16/5/86-14	3Cg2	2	86	12	0	0	0	0	0	1	50	32	4	12

Big Lake Core

Location: NE¼, SW¼, NE¼, Sec 9, T14N, R9E, Mississippi County, Arkansas, (Manila South 7½ minute Quadrangle)

Geomorphic Position: South edge of Big Lake on backswamp of the Mississippi River

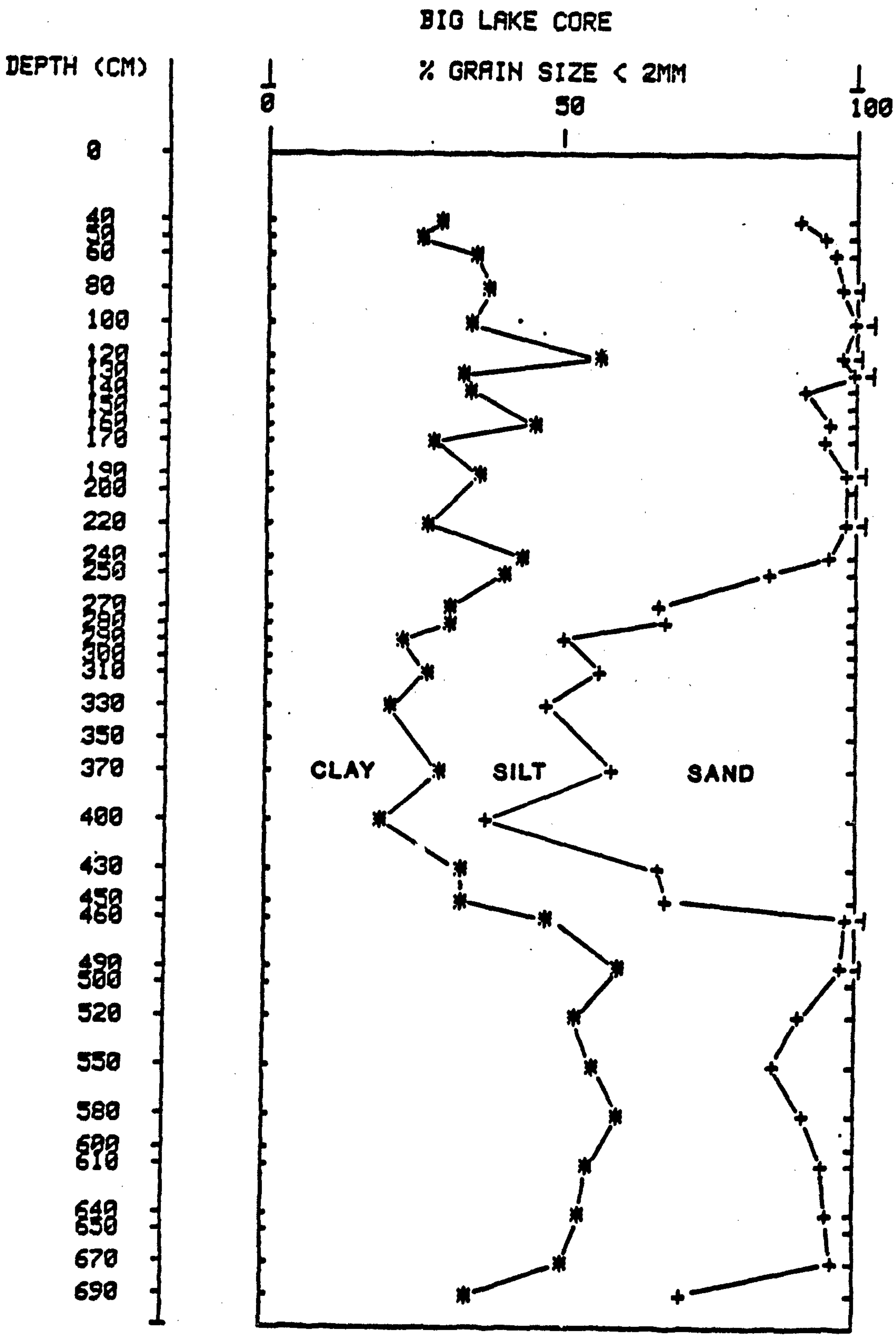
Elevation: 240 feet (73.2 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Patent Material	Description
0-46	46	Bw	Backswamp, Mississippi and Little Rivers	Silty clay loam, dark grayish brown (10YR 4/2) with small dark yellowish brown mottles (10YR 4/4), weak fine granular, gradational lower contact.
46-122	76	Cg		Silty clay loam, dark gray (10YR 4/1) with few small dark yellowish brown (10YR 4/4-4/6) mottles, massive, clear lower contact.
122-126	4	2A	Backswamp, Mississippi and Little Rivers	Silty clay, dark gray (10YR 4/1) with diffuse dark yellowish brown (10YR 4/4) mottles, massive, clear lower contact.
126-135	9	2Btgb		Silty clay loam, dark gray (10YR 4/1) with some diffuse dark grayish brown (10YR 4/2) mottles, moderate medium subangular blocky, continuous clay skins, gradational lower boundary.
135-252	117	2Cg		Silty clay loam, dark gray (10YR 4/1-5/1) with few large upper dark yellowish brown (10YR 4/4) and lower dark reddish brown (5YR 3/3) mottles, lower 66 cm of unit is laminated, wood at 205-252 cm depth, clear lower contact.
252-285	33	3Cgl	Natural levee, Little River	Clay loam, dark grayish brown (10YR 4/2) with large dark reddish brown (5YR 3/3) mottles, massive, gradational lower contact.

285-312	27	3Cg2		Silty clay loam, gray (10YR 5/1) with few dark yellowish brown (10YR 4/6) and yellowish red (5YR 4/6) mottles, poorly bedded, clear lower boundary. 3,500 years B.P. from 274-335 cm depth.
312-446	134	3Cg3		Clay loam to silty clay loam, gray (10YR 5/1) with large strong brown (7.5YR 5/6) mottles, bedded, more clayey beds 4 to 15 cm thick and more sandy beds about 20 cm thick, clear lower contact.
446-686+	240+	4Cg	Backswamp, Mississippi River	Clay to silty clay, dark gray (5Y 4/1) with dark yellowish brown iron contretions and stains, poorly laminated to massive, wood present, 6,450 ± 200 years B.P. from 488-564 cm depth and 9,050 ± 150 years B.P. from 610-686 cm depth.

BIG LAKE CORE

Depth (cm)	SAMPLE	HORIZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY
34	14/18/86-31	Bw	9	61	30	0	0	0	0	1	7	34	21	6	30
50	14/18/86-32	Cg	5	68	27	0	0	0	0	0	4	39	24	5	27
78	14/18/86-33	Cg	3	61	36	0	0	0	0	0	2	26	29	6	36
99	14/18/86-34	Cg	2	60	38	0	0	0	0	0	1	20	32	8	38
118	14/18/86-35	Cg	1	65	35	0	0	0	0	0	1	21	36	8	35
123	14/18/86-36	2A	1	41	57	0	0	0	0	0	1	6	22	13	57
132	14/18/86-37	2Btgb	1	66	34	0	0	0	0	0	1	12	37	17	34
139	14/18/86-38	2Cg	9	57	35	0	0	0	1	1	7	19	32	6	35
160	14/18/86-39	2Cg	4	50	46	0	0	0	0	1	3	17	24	9	46
181	14/18/86-40	2Cg	5	66	29	0	0	0	0	1	4	32	27	7	29
189	14/18/86-41	2Cg	2	62	37	0	0	0	0	0	1	22	32	8	37
211	14/18/86-42	2Cg	1	71	28	0	0	0	0	0	1	38	27	6	28
231	14/18/86-43	2Cg	3	52	44	0	0	0	0	1	2	19	24	9	44
240	14/18/86-44	2Cg	14	45	41	0	0	0	2	5	7	16	20	9	41
261	14/18/86-45	3Cg1	33	35	32	0	0	0	4	10	20	19	11	5	32
277	14/18/86-46	3Cg1	32	36	32	0	0	0	3	8	21	22	9	5	32
288	14/18/86-47	3Cg2	49	27	24	0	0	0	4	15	31	18	7	2	24
306	14/18/86-48	3Cg2	42	29	28	0	0	0	3	14	25	16	9	4	28
322	14/18/86-49	3Cg3	52	26	22	0	0	0	4	19	30	16	7	3	22
363	14/18/86-50	3Cg3	41	29	30	0	0	1	11	18	11	17	8	4	30
394	14/18/86-51	3Cg3	62	18	20	0	0	0	18	31	12	10	6	2	20
424	14/18/86-52	3Cg3	33	33	34	0	0	0	7	13		20	9	4	34
443	14/18/86-53	3Cg3	33	34	34	0	0	1	15	17		20	10	4	34
455	14/18/86-54	4Cg	2	51	48	0	0	0	1	1		25	21	5	48
486	14/18/86-55	4Cg	1	38	60	0	0	0	1	1	0	14	21	3	60
516	14/18/86-56	4Cg	8	38	53	0	0	0	2	3	2	5	27	6	53
546	14/18/86-57	4Cg	13	31	56	0	0	2	4	4	2	7	15	9	56
577	14/18/86-58	4Cg	8	32	60	0	0	2	3	1	1	2	16	14	60
608	14/18/86-59	4Cg	5	40	55	0	0	1	1	1	1	11	17	12	55
637	14/18/86-60	4Cg	5	42	54	0	0	1	1	1	2	14	18	10	54
662	14/18/86-61	4Cg	3	46	51	0	0	1	0	0	1	19	17	10	51
684	14/18/86-62	5Cg	29	36	35	0	0	0	1	5	23	22	8	6	35


BIG LAKE CORE
DEPTH (CM)
% GRAIN SIZE < 2MM
0
50
100
0
40
50
60
80
100
120
130
140
150
160
170
190
200
220
240
250
270
280
290
300
310
330
350
370
400
430
450
460
490
500
520
550
580
600
610
640
650
670
690
CLAY
SILT
SAND

Bridge Area 2 Cut

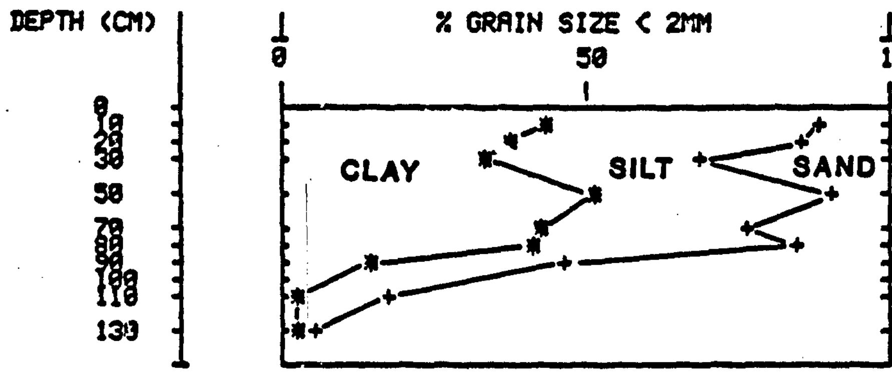
Location: NW¼, NE¼, NW¼, Sec 6, T15N, R9E, Mississippi County, Arkansas (Manila North 7½ minute Quadrangle)

Geomorphic Position: Channel-fill of relict braided stream

Elevation: 241 feet (73.5 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-16	16	Cg1	Slackwater channel-fill, braided stream channel	Silty clay, very dark grayish brown (10YR 3/2), with dark grayish brown (10YR 4/2) mottles along roots, massive, wood present, gradational lower contact.
16-51	35	Cg2		Clay loam, dark grayish brown (10YR 4/2) with dark yellowish brown (10YR 4/6) mottles, root holes, wood present.
51-81	30	Cg3		Clay, dark gray (10YR 4/1) to very dark gray (10YR 3/1) with grayish brown (10YR 5/2) and few dark yellowish brown (10YR 4/6) mottles, massive, wood present.
81-98	17	Cg4		Sandy loam, gray (10YR 5/1) with yellowish brown (10YR 5/6-4/4), mottles, massive, wood in growth position
98-117	19	2Cg1	Braided stream	Loamy sand, dark grayish brown (10YR 4/2) bedded, tree trunk in situ.
117-127+	10+	2Cg2		Sand, medium-grained, grayish brown (10YR 5/2) with areas of gray (10YR 5/1), bedded.

BRIDGE AREA 2



BRIDGE AREA 2

Depth (cm)	SAMPLE	HORIZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY
7	13/08/86-1	Cg1	11	45	44	0	0	0	2	5	3	30	10	5	44
15	13/08/86-2	Cg1	13	48	38	0	0	1	3	5	3	24	18	6	38
23	13/08/86-3	Cg2	31	35	34	0	0	1	9	15	6	20	12	3	34
41	13/08/86-4	Cg2	10	39	52	0	0	0	2	4	3	18	16	5	52
61	13/08/86-5	Cg3	23	34	43	0	0	0	4	12	6	16	12	6	43
74	13/08/86-6	Cg3	15	43	42	0	0	0	3	7	4	18	19	6	42
89	13/08/86-7	Cg4	53	32	15	0	0	1	11	26	15	21	9	2	15
107	13/08/86-8	2Cg1	82	15	3	0	0	3	34	36	10	8	6	1	3
127	13/08/86-9	2Cg2	95	5	0	0	0	0	51	41	3	3	2	0	0

Country Club 1 Core

Location: SW¼, SE¼, SE¼, Sec 19, T15N, R9E, Mississippi County, Arkansas (Manila North 7½ minute Quadrangle)

Geomorphic Position: Relict braided stream

Elevation: 238 feet (72.5 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizion	Parent Material	Description
0-25	25	C1	Braided stream	Sand, medium-grained, yellowish brown (10YR 5/4), massive.
25-123	98	C2		Silty clay loam interbedded with sand, medium-grained, yellowish brown (10YR 5/4) in upper portion and pale brown (10YR 6/3) below.

Country Club 2 Core

Location: NW¼, NW¼, NW¼, Sec 29, T15N, R9E, Mississippi County, Arkansas (Manila North 7½ minute Quadrangle)

Geomorhic Position: Channel-fill of relict braided stream

Elevation: 236 feet (71.9 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-10	10	C	Debris flow	Sand, medium-grained, pale brown (10YR 6/3) massive.
10-22	12	2Apb	Channel-fill, braided stream channel	Loamy sand, medium-grained, very dark gray (10YR 3/1), massive, organic matter, sharp lower contact.
22-32	10	2C		Loamy sand, medium-grained, dark brown (10YR 3/3), laminated.
32-36	6	2Cg		Silty clay, dark gray (10YR 4/1).
36-110+	74+	3C	Braided stream	Sand, medium grained, brown (10YR 5/3).

Country Club 3 Core

Location: NE¼, NE¼, NW¼, Sec 29, T15N, R9E, Mississippi County, Arkansas
(Manila North 7½ minute Quadrangle)

Geomorphic Position: Natural levee of Right Hand Chute of the Little River

Elevation: 242 feet (73.8 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-36	36	C1	Natural levee, Little River	Loamy sand, dark brown (10YR 3/3), laminated, clear lower contact.
36-86	50	C2		Silt loam, dark brown (10YR 3/3) massive, clear lower contact.
86-97	11	2Ab	Natural levee, Little River	Silty clay, brown (10YR 4/3), clear lower contact.
97-101	4	2Bwb1		Silty clay, dark yellowish brown (10YR 4/4) with very dark grayish brown (10YR 3/2) organic films, weak fine subangular blocky, sharp lower contact.
101-110	9	2Bwb2		Loamy sand, fine-grained, dark yellowish brown (10YR 4/4), massive, sharp lower contact.
110-118	8	2Bwb3		Silty clay, dark yellowish brown (10YR 4/4) with very dark grayish brown (10YR 3/2) organic films, weak fine subangular blocky, gradational lower contact.
118-134	16	2C1		Silty clay, yellowish brown (10YR 5/6), massive.
134-146+	12+	2C2		Sandy clay loam, fine-grained.

Country Club 4 Core

Location: SW¼, SW¼, NW¼, Sec 28, T15N, R9E, Mississippi County, Arkansas (Manila North 7½ minute Quadrangle)

Geomorphic Position: Natural levee of Right Hand Chute of the Little River

Elevation: 239 feet (72.8 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-10	10	Ap	Natural levee, Little River	Loamy sand, dark brown (10YR 3/3), platy.
10-25	15	A		Loamy sand, dark brown (10YR 3/3), laminated, clear lower contact.
25-74	49	Bt1		Sandy loam, very fine-grained sand, dark brown (7.5YR 3/2), weak fine subangular, blocky with weak clay skins, gradational lower contact.
74-101	27	Bt2		Sandy clay loam, dark brown (10YR 3/3), weak medium subangular block with weak clay skins, clear lower contact.
101-112	11	2Bwb	Natural levee, Little River	Sandy loam, fine-grained, dark brown (10YR 3/3) with very dark grayish brown (10YR 3/2) clay skins, moderate medium subangular blocky, clear lower contact.
112-126	14	2BC		Loamy sand, medium-grained, dark yellowish brown (10YR 3/4), weak medium subangular blocky, gradational lower contact.
126-144+	18+	2C		Loamy sand, fine-grained, dark yellowish brown (10YR 3/4), bedded.

East Big Lake Core

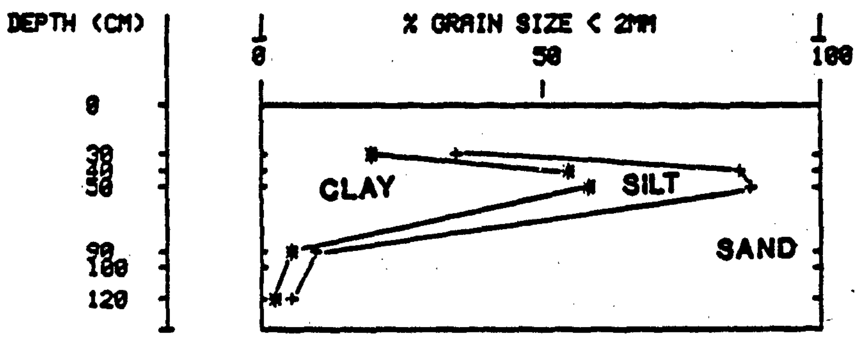
Location: NW¼, NE¼, SW¼, Sec 29, T16N, R10E, Mississippi County, Arkansas
(Half Moon 7½ minute Quadrangle)

Geomorphic Position: Backswamp of Mississippi River

Elevation: 235 feet (71.6 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-16	16		Driveway	
16-21	5	Ap	Natural levee, Little River	Sandy clay loam, black (10YR 2/1), massive.
21-37	16	C		Sandy loam with medium-grained sand lense at 34-37 cm, black (10YR 2/1) with dark yellowish brown (10YR 4/4) and gray (10YR 5/1) laminae, abrupt lower contact.
37-46	9	2Bgb	Backswamp, Mississippi and Little Rivers interbedded with crevasse channel deposits	Clay, gray (10YR 6/1) with yellowish brown (10YR 5/6) mottles, weak fine sub-angular blocky, abrupt lower contact.
46-121+	75+	2Cg	Little River	Clay, gray (10YR 6/1) with yellowish brown (10YR 5/6) mottles, massive, Contains thin lenses of light yellowish brown (10 YR 6/4) sand and granules and clayey sand lenses at 59-63, 71-82, and 110-121+ cm depths.

EAST BIG LAKE CORE



EAST BIG LAKE CORE

Depth (cm)	SAMPLE	HORIZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY
21	16/5/86-21	Ap	65	15	20	0	1	8	28	21	8	6	5	4	20
40	16/5/86-22	2Bgb	14	31	55	0	1	3	6	2	2	9	12	10	55
89	16/5/86-23	2Cg	12	29	59	0	0	3	5	2	2	7	12	10	59
116	16/5/86-24	2Cg	90	4	6	3	7	21	40	18	4	2	1	1	6

PERCENT ERROR

6/5/86-21= 5.13039825
6/5/86-22= .682294538
6/5/86-23= .413445024
6/5/86-24= 1.77969138

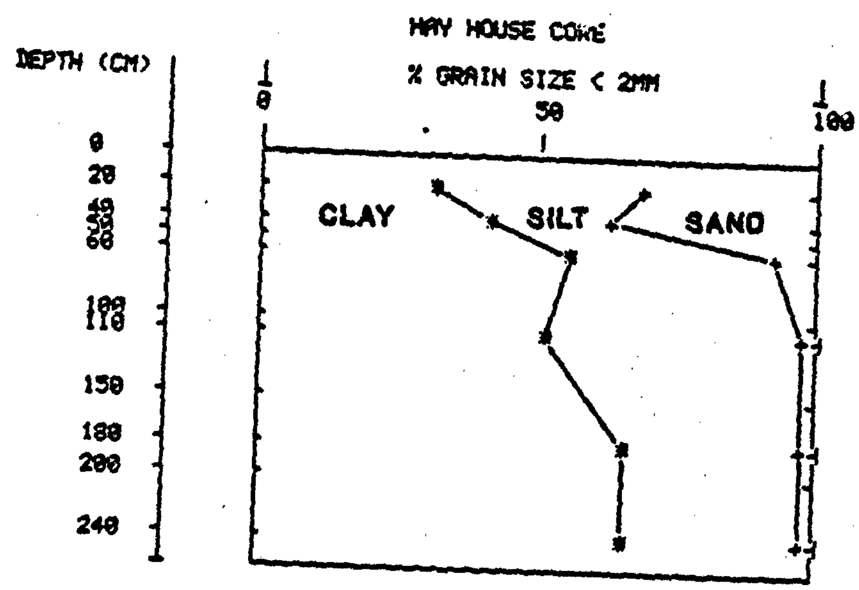
Hay House Core

Location: SE¼, SE¼, SE¼, Sec 22, T16N, R10E, Mississippi County, Arkansas (Half Moon 7½ minute Quadrangle)

Geomorphic Position: Backswamp of Mississippi River

Elevation: 241 feet (73.5 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-22	22	Ap	Natural levee, Mississippi River	Sandy clay loam, dark grayish brown (10YR 4/2), weak fine subangular blocky.
22-42	20	C		Sandy clay loam, dark brown (10YR 3/3), weak fine subangular blocky, sharp lower contact.
42-236+	194+	2Cg	Backswamp, Mississippi River	Clayey silt, grayish brown (10YR 5/2) with dark yellowish brown (10YR 4/4) mottles, pressure faces, possible charcoal at upper contact.



HAY HOUSE CORE

Depth (cm)	SAMPLE	HORIZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY
11	16/3/86-15	Ap	32	37	32	0	1	4	10	12	5	9	17	11	32
38	16/3/86-16	C	37	21	42	0	0	4	14	15	4	4	10	7	42
52	16/3/86-17	2Cg	6	37	56	0	0	1	2	2	1	7	18	12	56
109	16/3/86-18	2Cg	3	46	52	0	0	0	1	1	1	6	21	19	52
173	16/3/86-19	2Cg	2	32	66	0	0	1	1	0	0	5	13	14	66
234	16/3/86-20	2Cg	2	32	66	0	0	0	1	0	0	2	16	14	66

Just East of Big Lake Levee Core

Location: SW¼, SW¼, NE¼, Sec 30, T16N, R10E, Mississippi County, Arkansas (Half Moon 7½ minute Quadrangle)

Geomorphic Position: Backswamp of Mississippi River

Elevation: 238 feet (72.5 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-25	25	Ap	Natural levee, Little River	Clay loam, dark brown (10YR 3/3), massive, clear lower contact.
25-30	5	C1		Sandy loam, very dark grayish brown (10YR 3/2) with dark yellowish brown (10YR 3/4) mottles, massive, clear lower contact.
30-35	5	C2		Loam, dark brown (10YR 3/3) with few gray (10YR 5/1) mottles, massive, clear lower contact.
35-45	10	2Ab	Backswamp, Mississippi and Little Rivers	Clayey silt, dark brown (10YR 3/3) with black (10YR 2/1) streaks, massive, organic matter, clear lower contact.
45-62	17	2Cg		Silty clay, dark gray (10YR 4/1) with dark yellowish brown (10YR 3/6) mottles, massive, clear lower contact.
62-85	23	3Btgb	Backswamp, Mississippi and Little Rivers	Clayey silt, dark gray (10YR 4/1) with few dark yellowish brown (10YR 3/4) mottles, moderate medium subangular blocky with clay films or pressure faces, clear lower contact.
85-218+	133+	4Cg	Backswamp Mississippi and Little Rivers inter-bedded with crevasse channel deposits, Little River	Clayey silt, gray (10YR 5/1) with dark yellowish brown (10YR 4/4) mottles, moderate fine subangular blocky, medium sand lenses at 85-87, 144-147, and 151-157 cm.

Manila 1 Core

Location: SE¼, SW¼, SW¼, Sec 32, T16N, R8E, Mississippi County, Arkansas (Manila North 7½ minute Quadrangle)

Geomorphic Position: Relict braided stream

Elevation: 240 feet (73.2 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-30	30	Ap	Braided stream	Sand, medium-grained, dark brown (10YR 3/3), massive, lower contact gradational.
30-74	44	Cg1		Loamy sand, medium grained, dark grayish brown (10YR 4/2), bedded in lower 4 cm, lower contact clear.
74-108	34	Cg2		Loam, grayish brown (10YR 5/2), with large yellowish brown (10YR 5/6) mottles that become more abundant with depth, lower contact sharp.
108-128	20	C1		Sand, medium grained, pale brown (10YR 6/3), Mn stains, lower contact clear.
128-160+	32+	C2		Sandy loam, dark yellowish brown (10YR 3/4) with light brownish gray (10YR 6/2) mottles.

Manila 2 Core

Location: SW¼, SW¼, SE¼, Sec 31, T16N, R9E, Mississippi County, Arkansas (Manila North 7½ minute Quadrangle)

Geomorphic Position: Relict braided stream

Elevation: 241 feet (73.5 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-213+	213+		Braided stream	Sand, medium grained.

Manila 3 Core

Location: SE¼, SE¼, SW¼, Sec 36, T16N, R8E, Mississippi County, Arkansas
(Manila North 7½ minute Quadrangle)

Geomorphic Position: Relict braided stream

Elevation: 239 feet (72.8 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-164+	164+	C	Braided stream	Sand, medium-grained.

Manila 4 Core

Location: Center south line, SW¼, SW¼, Sec 35, T16N, R8E, Mississippi County, Arkansas, (Manila North 7½ minute Quadrangle)

Geomorphic Position: Channel-fill of relict braided stream

Elevation: 238 feet (72.5 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-16	16	Ap	Channel-fill braided stream channel	Sandy loam, very dark grayish brown (10YR 3/2).
16-49	33	C1		Sandy loam, very dark grayish brown (10YR 3/2) with grayish brown (10YR 5/2) lenses, well-sorted sand beds 15 to 37 cm depth, wood common at base.
49-55	6	C2		Silt loam, very dark gray (10YR 3/1), moderate fine subangular blocky, sand lenses, clear lower contacts.
55-65	10	C3		Sandy clay loam, very dark gray (10YR 3/1), wood present, lower contact sharp.
65-72	7	C4		Silt loam, very dark gray (10YR 3/1) with brown (10YR 4/3) sand lenses, sharp lower contact.
72-120	48	C5		Sandy loam, very dark gray (10 YR 3/1) with large dark reddish brown (5YR 3/4) mottles, massive, wood present, clear lower contact.
120-139	19	C6		Sandy loam, dark yellowish brown (10YR 3/4) with grayish brown (10YR 5/2) mottles, massive, Mn and Fe nodules, clear lower contact.
139-169	30	C7		Loamy sand, dark gray (10YR 4/1) and very dark gray (10YR 3/1) around organics, massive.
169-187+	18+	2Cg	Braided stream	Sand, medium-grained, dark grayish brown (10YR 4/2), massive.

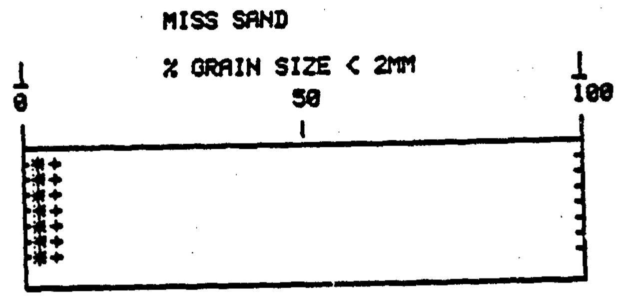
Miss Sand

Location: W½, E½ Sec 19, T16N, R11E, Mississippi County, Arkansas (Blytheville 7½ minute Quadrangle).

Geomorphic Position: Linear sand blow

Elevation: 246 feet (75.0 m) to 250 feet (76.2 m) above m.s.l.

This is a linear sand body approximately 6 km long and 0.6 m thick. It overlies gray silty clay. Samples were taken at the basal contact of the sand. Sampling sites are at regular intervals between the Arkansas-Missouri State line (4/20/86-14) at the north end of the sand body and Drainage Ditch 29 (4/20/86-19) at the south end of the sand body.



MISS SAND

SAMPLE	HORIZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY	
4/20/86-14	C	00	0	0	3	2	39	59	0	0	0	0	0	0	0
4/20/86-15	C	00	0	0	0	3	49	32	14	2	0	0	0	0	0
4/20/86-16	C	99	1	0	0	4	34	44	14	3	1	0	0	0	0
4/20/86-17	C	98	2	0	3	10	26	33	22	8	2	0	0	0	0
4/20/86-18	C	98	2	0	1	6	18	35	30	9	2	0	0	0	0
4/20/86-19	C	99	1	0	1	7	30	44	13	4	1	0	0	0	0

Pemiscot Bayou Core

Location: NE¼, NW¼, NW¼, Sec 29, T16N, R11E, Mississippi County, Arkansas (Blytheville 7½ minute Quadrangle)

Geomorphic Position: Outside edge of Pemiscot Bayou meander channel

Elevation: 246 feet (74.9 m) above m.s.l.

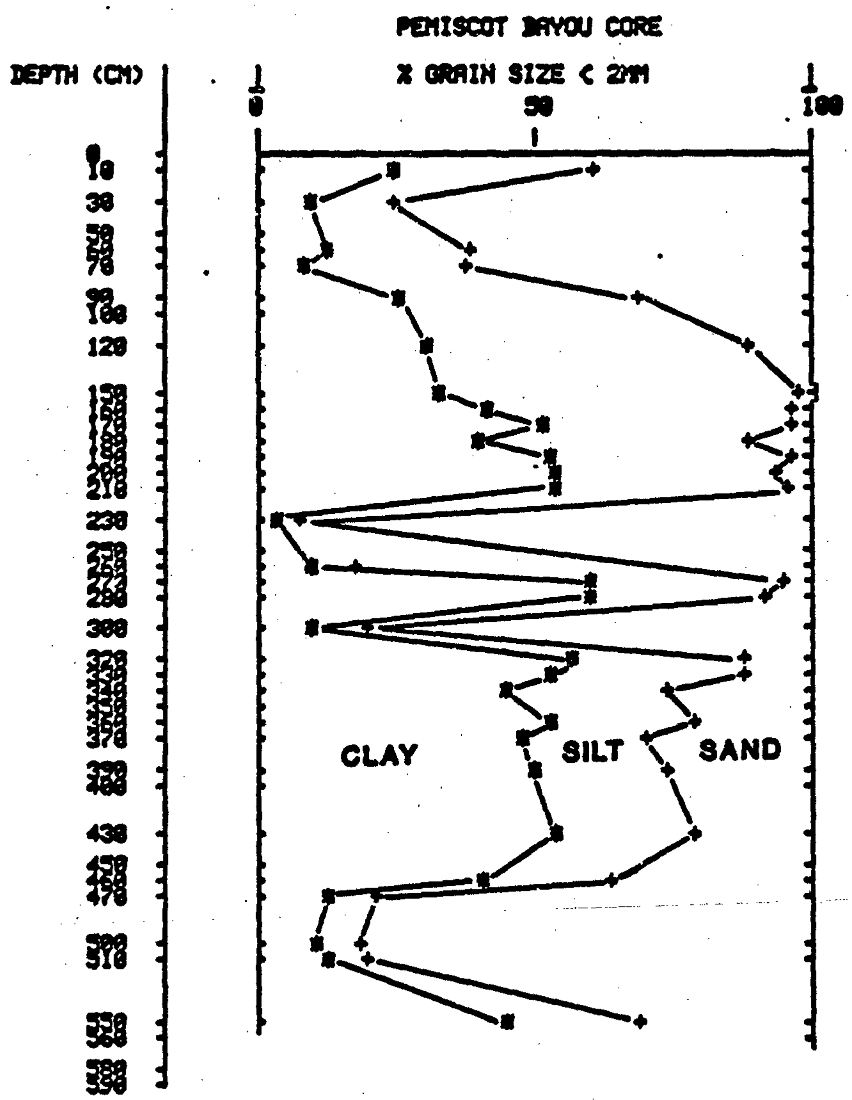
Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-17	17	Ap	Slackwater channel-fill, Pemiscot Bayou	Loam, very dark gray (10YR 3/1-3/2), weak fine granular, gradational lower contact.
17-63	46	Cg1		Sandy loam, dark grayish brown (10YR 4/2), weak laminations, gradational lower contact.
63-82	19	Cg2		Sandy loam, grayish brown (10YR 5/2-4/2), massive, abrupt lower contact.
82-91	9	2Ab(?)	Natural levee, Pemiscot Bayou	Loam, dark gray (10YR 4/1) with dark reddish brown (5YR 3/4) along joints, massive, gradational lower contact.
91-137	46	2Cg		Silty clay loam, dark grayish brown (10YR 4/2) massive, gradational lower contact.
137-152	15	3Ab1	Backswamp, Mississippi	Silty clay loam, dark gray (10YR 4/1), weak fine granular.
152-164	12	3Ab2		Silty clay, black (10YR 2/1), moderate fine granular, laminated, clear lower contact.
164-184	20	3Cg		Silty clay, dark grayish brown (10YR 4/2) with indistinct yellowish brown (10YR 5/4) mottles, weak fine granular, clear lower contact, 3,160 ± 110 years B.P. from 152-213 cm depth.
184-188	4	4Ab	Backswamp interbedded with crevasse splay, Mississippi River	Silty clay, very dark gray (10YR 3/1), weak fine granular, clear lower contact.

188-259	71	4Cg1		Silty clay, grayish brown (10YR 5/2) becoming gray (10YR 5/1) with depth, massive with thin sand beds.
259-286	27	4Cg2		Sand, medium-grained, grayish brown (10YR 5/2), massive, abrupt lower contact.
286-320	34	4Cg3		Clay, light grayish brown (10YR 6/2) to gray (10YR 5/1) in lower portion, with dark yellowish brown (10YR 4/6) iron stains, few Mn stains, 0.4 cm thick sand lense near base.
320-335	15	4C		Loamy sand, medium-grained, pale brown (10YR 6/3), bedded with 3 cm thick silty clay with lower contact clear and upper contact gradational.
335-366	31	4Cg4		Clay, gray (10YR 5/1) with some dark yellowish brown (10YR 4/4-4/6) mottles, massive, some Fe stains, few Mn stains.
366-371	5	5Ab?	Natural levee, Mississippi River	Clay dark grayish brown (10YR 4/2), massive, lower contact abrupt.
371-457	86	5Cg		Clay, gray (10YR 6/1) with abundant yellowish brown (10YR 5/6) mottles.
457-459	2	6Ab?	Natural levee, interbedded with crevasse splay, Mississippi River	Clay, gray (7.5YR 5/1) with brown (10YR 4/3) and dark yellowish brown (10YR 4/6) mottles, distorted thin laminae, Mn nodules, wood (?) present.
459-549	90	6Cg1		Clay interbedded with sandy loam, gray (10YR 5/1) with large abundant dark yellowish brown (10YR 4/6) mottles, bedded with sandy lenses at 482 cm, 520-528 cm, 541-549 cm depths, gradational lower contact, 8,530 $\pm$ 300 years B.P. from 442-518 cm depth.

549-580	31	6Cg2	Sandy loam, gray (10YR 5/1) to grayish brown (10YR 5/2) in more sandy zones, bedding indistinct, clear lower contact.
580-594+	14+	6Cg3	Clay, gray (10YR 5/1) with abundant yellowish brown (10YR 4/6-5/6) mottles, massive.

PEMISCOT BAYOU CORE

Depth	SAMPLE	HORIZON	TOTAL			GRAVEL	SAND					SILT			CLAY
(cm)			SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
8	14/08/86-1	Ap	38	36	25	0	0	8	17	7	6	10	18	8	25
26	14/08/86-2	Cg1	75	15	10	0	0	18	35	13	9	8	6	1	10
55	14/08/86-3	Cg1	61	26	13	0	0	10	22	14	15	13	10	3	13
68	14/08/86-4	Cg2	62	29	9	0	0	6	16	17	23	22	6	1	9
87	14/08/86-5	2Ab(?)	31	43	26	0	0	1	2	8	20	27	11	5	26
112	14/08/86-6	2Cg	11	58	31	0	0	0	0	4	6	29	23	6	31
149	14/08/86-7	3Ab1	3	65	33	0	0	0	1	1	1	25	30	10	33
160	14/08/86-8	3Ab2	3	55	42	0	0	1	1	1	1	8	38	9	42
175	14/08/86-9	3Cg	3	45	52	0	0	1	1	1	1	6	29	10	52
186	14/08/86-10	4Ab	10	49	40	0	0	1	3	3	3	10	29	10	40
200	14/08/86-11	4Cg1	3	44	53	0	0	1	1	1	1	5	29	10	53
227	14/08/86-12	4Cg1	5	40	54	0	0	1	1	1	1	4	27	9	54
254	14/08/86-13	4Cg1	4	42	54	0	0	0	1	1	1	5	27	10	54
262	14/08/86-14	4Cg2	92	4	4	0	3	22	44	19	5	1	3	0	4
278	14/08/86-15	4Cg2	83	8	10	0	1	19	42	16	4	2	4	2	10
297	14/08/86-16	4Cg3	5	35	60	0	0	1	2	1	1	5	20	10	60
315	14/08/86-17	4Cg3	7	32	60	0	0	1	2	2	1	2	20	10	60
327	14/08/86-18	4C	80	10	10	0	1	18	40	16	5	3	4	3	10
339	14/08/86-19	4Cg4	13	31	57	0	0	3	4	3	2	2	19	10	57
359	14/08/86-20	4Cg4	12	35	53	0	0	5	3	2	2	4	20	11	53
368	14/08/86-21	5Ab(?)	27	29	45	0	0	5	13	7	2	3	18	8	45
384	14/08/86-22	5Cg	21	26	53	0	1	5	8	5	3	3	15	8	53
424	14/08/86-23	5Cg	30	22	48	0	2	7	10	6	5	2	11	9	48
455	14/08/86-24	5Cg	25	24	50	0	0	1	2	11	11	4	19	1	50
466	14/08/86-25	6Cg1	21	25	54	0	1	3	5	7	6	11	4	10	54
500	14/08/86-26	6Cg1	37	23	41	0	0	4	9	9	14	9	8	6	41
544	14/08/86-27	6Cg1	78	9	13	0	2	20	38	12	6	4	3	2	13
558	14/08/86-28	6Cg2	81	8	11	0	3	21	38	13	6	3	3	2	11
576	14/08/86-29	6Cg2	79	7	13	0	1	17	45	9	5	3	2	2	13
585	14/08/86-30	6Cg3	31	24	45	0	0	3	7	6	15	10	8	6	45


PEMISCOT BAYOU CORE
DEPTH (CM)
% GRAIN SIZE < 2MM
0
50
100
CLAY
SILT
SAND

State Line Cut

Location: NW¼, NW¼, NW¼, Sec 19, T16N, R11E, Mississippi County, Arkansas (Blytheville 7½ minute Quadrangle)

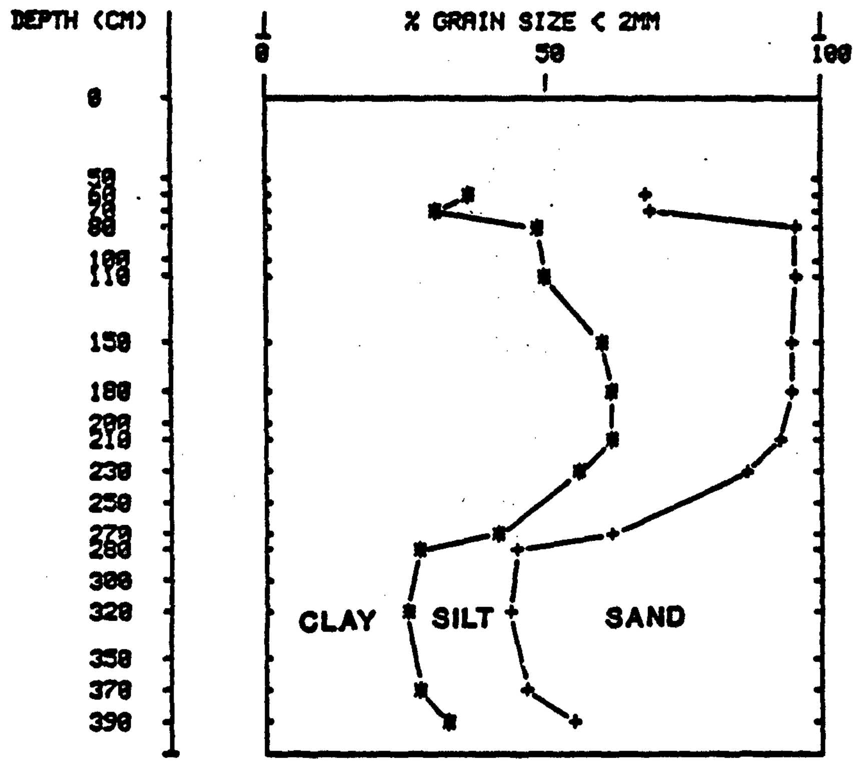
Geomorphic Position: Backswamp of Mississippi River

Elevation: 247 feet (75.3 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-48	48		Spoil from drainage ditch	
48-58	10	Bt	Natural levee, Mississippi River	Clay loam, very dark grayish brown (10YR 3/2), strong medium subangular blocky, abrupt lower contact.
58-65	7	Cg		Clay loam, dark gray (10YR 4/1) with dark yellowish brown (10YR 4/6) mottles, weak medium sub-angular blocky, sharp lower contact.
65-126	61	2Btgb	Backswamp, Mississippi River	Silty clay, dark gray (10YR 4/1) with few dark yellowish brown (10YR 3/6) and dark red (2.5YR 3/6) mottles, strong fine subangular blocky becoming coarse with depth, clear lower contact.
126-197	71	2Cg1		Clay, grayish brown (10YR 5/2) with abundant yellowish brown (10YR 5/6) and very dark gray (10YR 3/1) mottles, weak coarse sub-angular blocky, lower contact gradational.
197-248	51	2Cg2		Clay, dark gray (10YR 4/1) with diffuse yellowish brown (10YR 5/4) mottles in upper portion of unit, medium coarse subangular blocky, Fe stains, slickensides, lower contact clear.
248-376	128	3Cg1	Natural levee, Mississippi River	Sandy clay loam, grayish brown (10YR 5/2) with abundant dark yellowish brown (10YR 4/6) mottles, weak medium subangular blocky becoming coarse with depth.

376-395+	19+	3Cg2	Clay loam, gray (10YR 5/1) with few yellowish brown (10YR 5/4) mottles, strong medium subangular blocky with some pressure faces.

STATE LINE CUT



STATE LINE CUT

Depth (cm)	SAMPLE	HORIZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY
53	14/20/86-1	Bt	32	31	37	0	0	5	14	8	4	6	10	15	37
62	14/20/86-2	Cg	31	38	31	0	0	6	15	7	4	18	13	7	31
74	14/20/86-3	2Btgb	4	47	49	0	0	1	1	1	1	7	27	13	49
108	14/20/86-4	2Btgb	4	46	50	0	0	0	1	2	1	5	29	12	50
144	14/20/86-5	2Cg1	5	35	60	0	0	0	1	2	1	4	20	11	60
173	14/20/86-6	2Cg1	5	33	62	0	0	0	1	2	1	2	21	10	62
207	14/20/86-7	2Cg2	7	31	62	0	0	0	1	3	2	4	15	12	62
234	14/20/86-8	2Cg2	14	31	56	0	0	0	3	7	3	3	16	12	56
262	14/20/86-9	3Cg1	38	20	42	0	0	1	11	21	6	5	8	7	42
275	14/20/86-10	3Cg1	54	17	28	0	0	1	17	29	6	3	9	5	28
314	14/20/86-11	3Cg1	56	18	26	0	0	4	20	24	7	6	8	4	26
362	14/20/86-12	3Cg1	53	19	28	0	0	2	20	24	7	7	8	4	28
383	14/20/86-13	3Cg2	44	22	33	0	0	3	18	17	5	0	10	4	33

West Big Lake Core

Location: NW¼, NW¼, NW¼, Sec 4, T15N, R9E, Mississippi County, Arkansas (Manila North 7½ minute Quadrangle)

Geomorphic Position: Natural levee of Right Hand Chute of the Little River

Elevation: 237 feet (72.2 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-5	5	Ap	Natural levee, Little River	Sandy loam, very fine-grained, dark brown (10YR 4/3), weak granular, clear lower contact.
5-21	16	Bg		Sandy loam, very fine-grained, grayish brown (10YR 5/2), weak fine granular, lower contact clear.
21-32	11	C1		Sandy loam, very fine-grained, brown (10YR 5/3) with medium distinct dark yellowish brown (10YR 4/4-3/4) mottles, weak fine granular, lower contact gradational.
32-44	12	C2		Sandy loam, very fine-grained, brown (10YR 5/3-5/4), massive.
44-61	12	C3		Sandy loam, fine-grained, dark brown (10YR 4/3) with few large indistinct grayish brown (10YR 5/2) mottles, massive, clear lower contact.
61-91	30	2C1	Natural levee, Little River	Sandy loam, very fine-grained, dark yellowish brown (10YR 3/4) with few light brownish gray (10YR 6/2) horizontal mottles, massive, gradational lower contact.
91-123	32	2Cg		Sandy loam, fine-grained, gray (10YR 5/1) with abundant large dark yellowish brown (10YR 4/4-5/6) mottles, massive, gradational lower contact.
123-137	14	2C2		Sandy loam, fine to medium-grained, yellowish brown (10YR 5/4-4/3), massive, gradational lower contact.

137-229+	92+	3C	Braided stream	Sand, medium-grained, brown (10YR 5/3), massive.

West Big Lake Test Pit #1

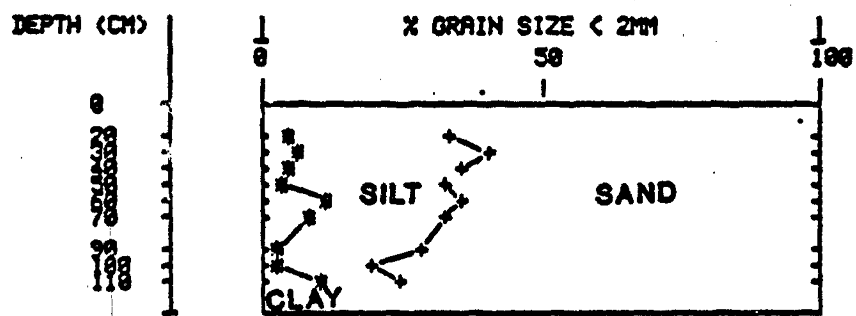
Location: SW¼, NW¼, NW¼, Sec 4, T15N, R9E, Mississippi County, Arkansas (Manila North 7½ minute Quadrangle). This is Archeological site 3MS21.

Geomorphic Position: Natural levee of Right Hand Chute of the Little River

Elevation: 237 feet (72.2 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-20	20	Ap	Natural levee, Little River	Sandy loam, fine-grained, dark yellowish brown (10YR 3/4), massive, lower contact abrupt, wavy.
20-34	14	B		Sandy loam, fine-grained, dark brown (10YR 3/3) with very dark grayish mottles, weak medium platy, brown (10YR 3/4) lower contact gradational.
34-44	10	C		Sandy loam, fine-grained, dark yellowish brown (10YR 4/4) with indistinct mottles, massive, lower contact abrupt.
44-52	8	2Bwb	Natural levee, Little River	Sandy loam, fine-grained, dark yellowish brown (10YR 3/6), medium subangular blocky, abundant root pores, lower contact abrupt.
52-89	37	2C		Sandy loam, fine-grained, dark yellowish brown (10YR 4/4) with few indistinct mottles at top, massive.
89-97	10	3Bwb	Natural levee, Little River	Sandy loam, fine-grained, brown (10YR 4/3) with gray mottles, weak medium subangular blocky with weak clay skins.
97-107+	10+	3Btb		Sandy loam, fine-grained, dark yellowish brown (10YR 3/6), weak medium subangular blocky, weak clay skins.

WEST BIG LAKE TEST PIT#1



WEST BIG LAKE TEST PIT#1

Depth (cm)	SAMPLE	HORIZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY
13	13/08/86-1	Ap	66	29	5	0	0	0	6	32	26	23	4	2	5
24	13/08/86-2	B	59	34	7	0	0	0	5	29	25	24	7	3	7
33	13/08/86-3	B	64	31	5	0	0	0	6	31	26	23	7	1	5
41	13/08/86-4	C	67	29	4	0	0	0	6	32	28	22	6	1	4
46	13/08/86-5	2Bwb	64	24	12	0	0	0	6	31	26	19	4	1	12
52	13/08/86-6	2C	67	24	9	0	0	0	7	33	27	17	5	2	9
65	13/08/86-7	2C	73	26	3	0	0	0	7	35	29	19	5	2	3
83	13/08/86-8	2C	81	17	3	0	0	1	8	36	37	12	3	2	3
93	13/08/86-9	3Bwb	75	14	11	0	0	2	9	34	30	10	3	1	11
104	13/08/86-10	3Btb	73	15	12	0	0	2	14	31	26	11	3	1	12

Wood Core

Location: SW¼, SW¼, NE¼, Sec 5, T15N, R9E, Mississippi County, Arkansas (Manila North 7½ minute Quadrangle)

Geomorphic Position: Natural levee of Right Hand Chute of the Little River

Elevation: 238 feet (72.5 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-10	10	Ap	Channel, Little River	Sand, medium-grained, dark brown (10YR 3/3), massive.
10-17	7	Bw		Sand, medium-grained, dark brown (10YR 3/3) with dark grayish brown (10YR 4/2) medium indistinct mottles, very weak fine subangular blocky.
17-40	23	C		Sand, medium-grained, dark brown (10YR 3/3) with dark grayish brown (10YR 4/2) medium, indistinct mottles, massive, possible organics at basal contact, clear lower contact.
40-50	10	2Cg	Natural levee, Little River	Sandy loam, very fine-grained, gray (10YR 5/1) with some dark yellowish brown (10YR 3/4) mottles, Mn stains, diffuse lower contact.
50-80	30	2C1		Silt loam, very fine-grained, dark yellowish brown (10YR 4/6) with large gray (10YR 6/1) and dark yellowish brown (10YR 3/4) mottles, massive, Mn stains, gradational lower contact.
80-115	35	2C2		Loam, very fine-grained, dark yellowish brown (10YR 4/4) with few light brownish gray (10YR 6/2) mottles, massive, few Mn stains.
115-161+	46+	2C3		Loamy sand, fine-grained becoming coarser with depth, dark yellowish brown (10YR 4/4) with very few indistinct grayish brown (10YR 5/2) mottles.

Yarbro Core

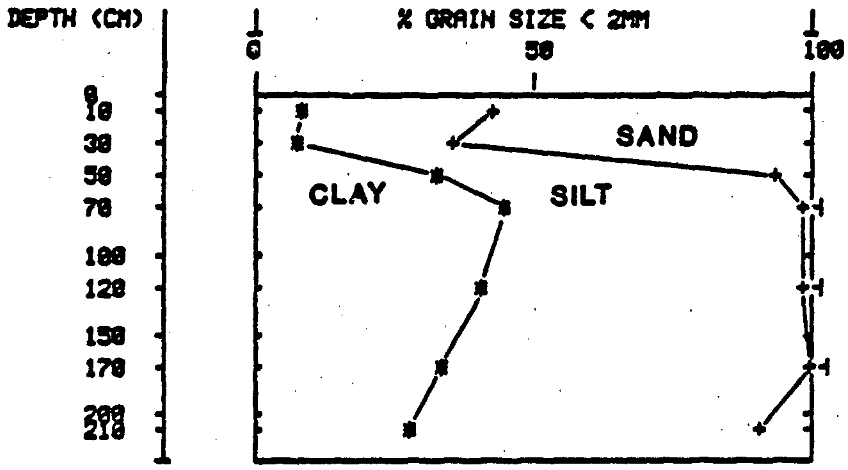
Location: NE¼, NW¼, SW¼, Sec 27, T16N, R11E, Misssissippi County, Arkansas
(Blytheville 7½ minute Quadrangle)

Geomorphic Position: Mississippi River abandoned meander channel

Elevation: 251 (76.5 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0-28	28	Ap	Natural levee, Pemiscot Bayou	Sandy loam, dark brown (10YR 3/3), weak platy structure above, becoming massive in lower 10 cm, abrupt lower contact.
28-39	11	Cg		Sandy loam, dark grayish brown (10YR 4/2) with dark yellowish brown (10YR 4/6) mottles, Mn stains and nodules, massive structure, abrupt lower contact.
39-188	149	2Cg	Backswamp, Mississippi River	Silty clay loam, dark gray (10YR 4/1) with dark yellowish brown (10YR 4/3-6) mottles which become more abundant with depth, pressure faces or clay skins strongest at 62-85 cm depth, clear lower contact.
188-230+	42+	3C	Channel-fill, Mississippi River	Silty clay loam, brown (10YR 4/3) with grayish brown (10YR 5/2) mottles, massive structure.

YARBRO CORE



YARBRO CORE

Depth (cm)	SAMPLE	HORIZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY
6	16/5/86-1	Ap	58	34	9	0	1	3	10	23	21	26	5	3	9
25	16/5/86-2	Ap	64	28	8	0	0	3	10	25	26	21	5	2	8
43	16/5/86-3	2Cg	5	61	33	0	0	0	0	1	4	24	27	10	33
69	16/5/86-4	2Cg	1	54	45	0	0	0	0	0	1	20	24	10	45
117	16/5/86-5	2Cg	1	58	41	0	0	0	0	0	0	21	28	9	41
164	16/5/86-6	2Cg	1	66	34	0	0	0	0	0	0	27	31	8	34
208	16/5/86-7	3C	8	63	28	0	0	0	0	1	7	37	20	6	28

Zebree - Big Lake Core*

Location: NW¼, Sec 23, T15N, R9E, Mississippi County, Arkansas, (Half Moon 7½ minute Quadrangle).

Geomorphic Position: Bay of Little River in Big Lake National Wildlife Refuge; under approximately 2 m of water.

Elevation: 224 feet (68.1 m) above m.s.l.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0- 45		45	Slackwater channel-fill, Little River	Silt, organic, loosely cosolidated
45-155	110	C2		Clay, organic, blocky
155-160	5	C3		Organic debris including sticks, twigs, and leaves, 180 years B. from 155-160 cm depth.
160-170+	10+	2C	Natural levee, Little River	Sandy clay, nonorganic, hard, dr

* Description and date from King (1980), interpretation of parent material and horizon nomenclature by Guccione (this report).

APPENDIX E

PLATES

Plate 1. Ditch 29, across the drained bed of Big Lake Swamp.

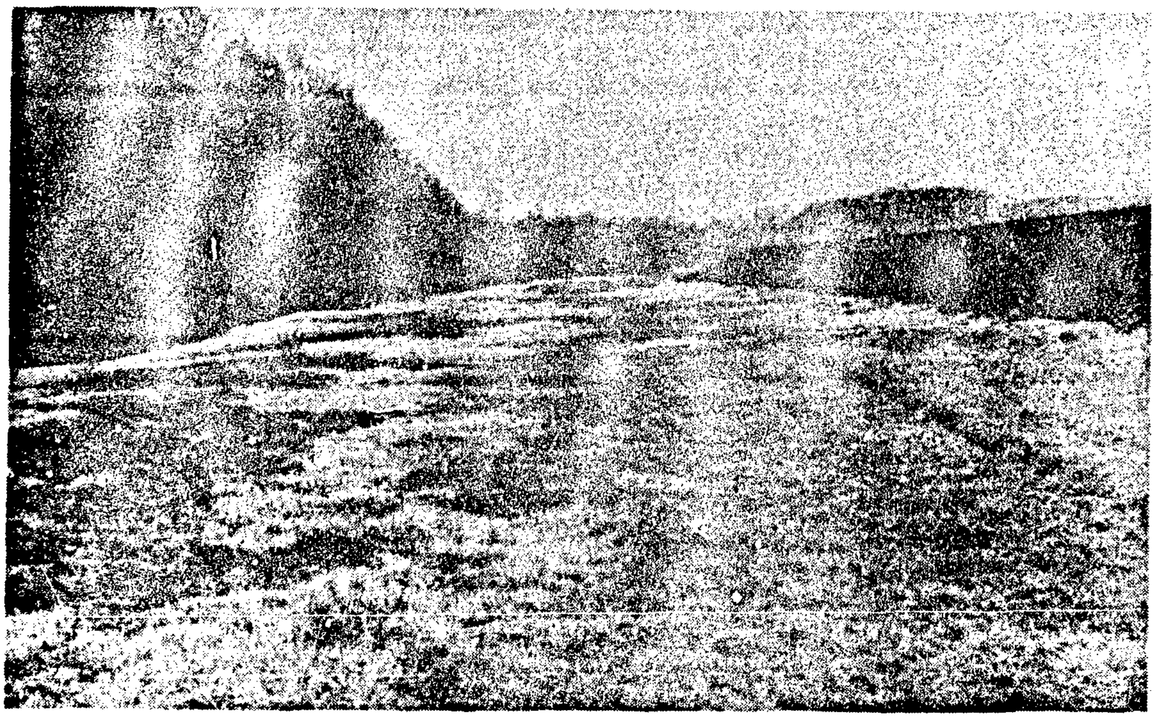


Plate. 2 Ditch 10, Tree line at left, levee around Big Lake Swamp to right.

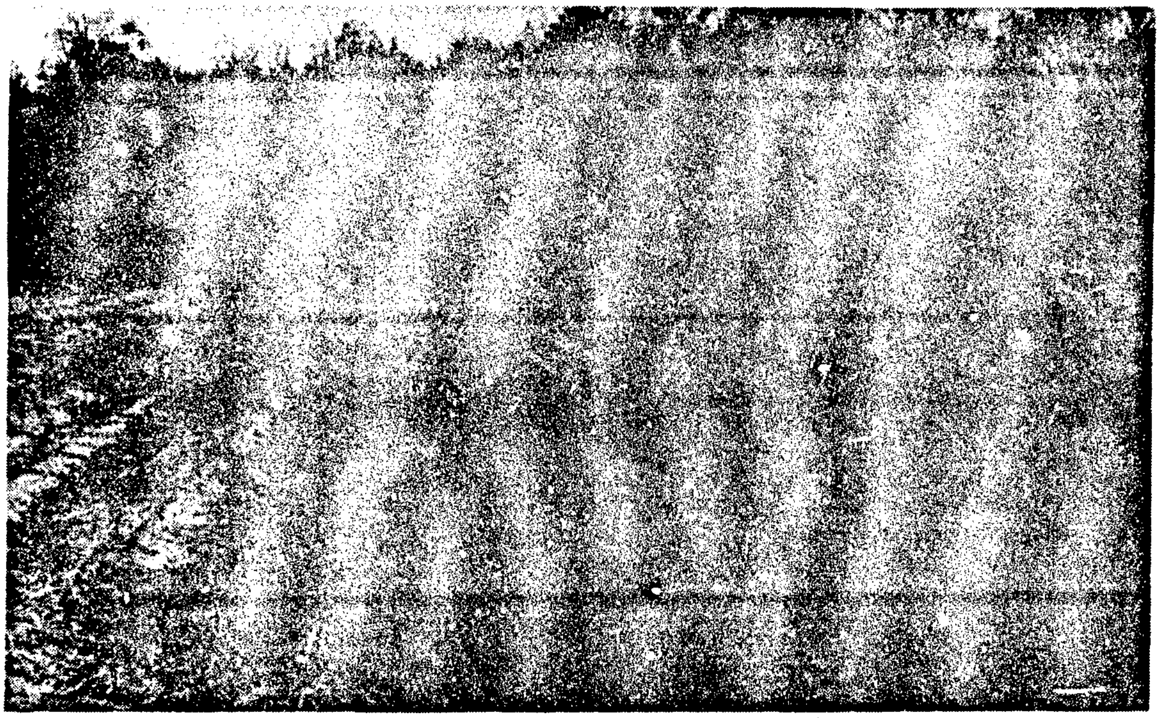


Plate 3. Ditch 10, tree line beyond people.

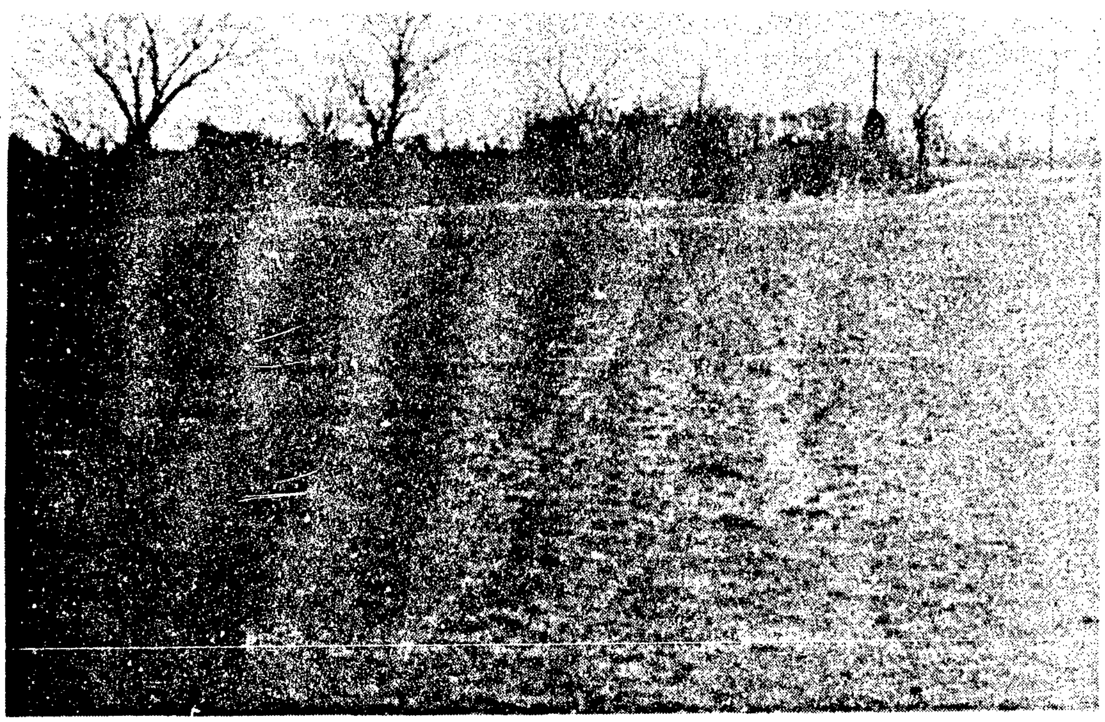


Plate 4. Ditch 12 on Relict Braided Surface.

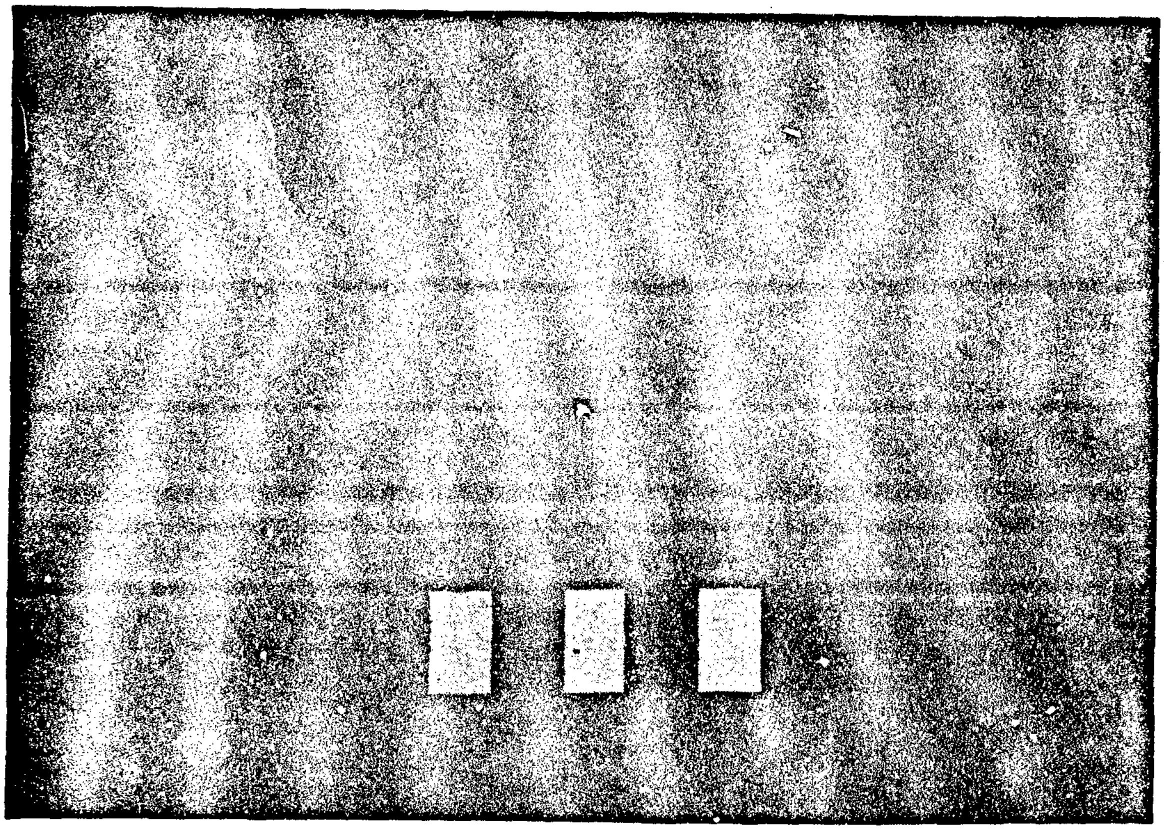


Plate 5. Selected artifacts from 3MS199: A & B. Sand-tempered effigy fragments; C. cordmarked, sand-tempered rim sherd.

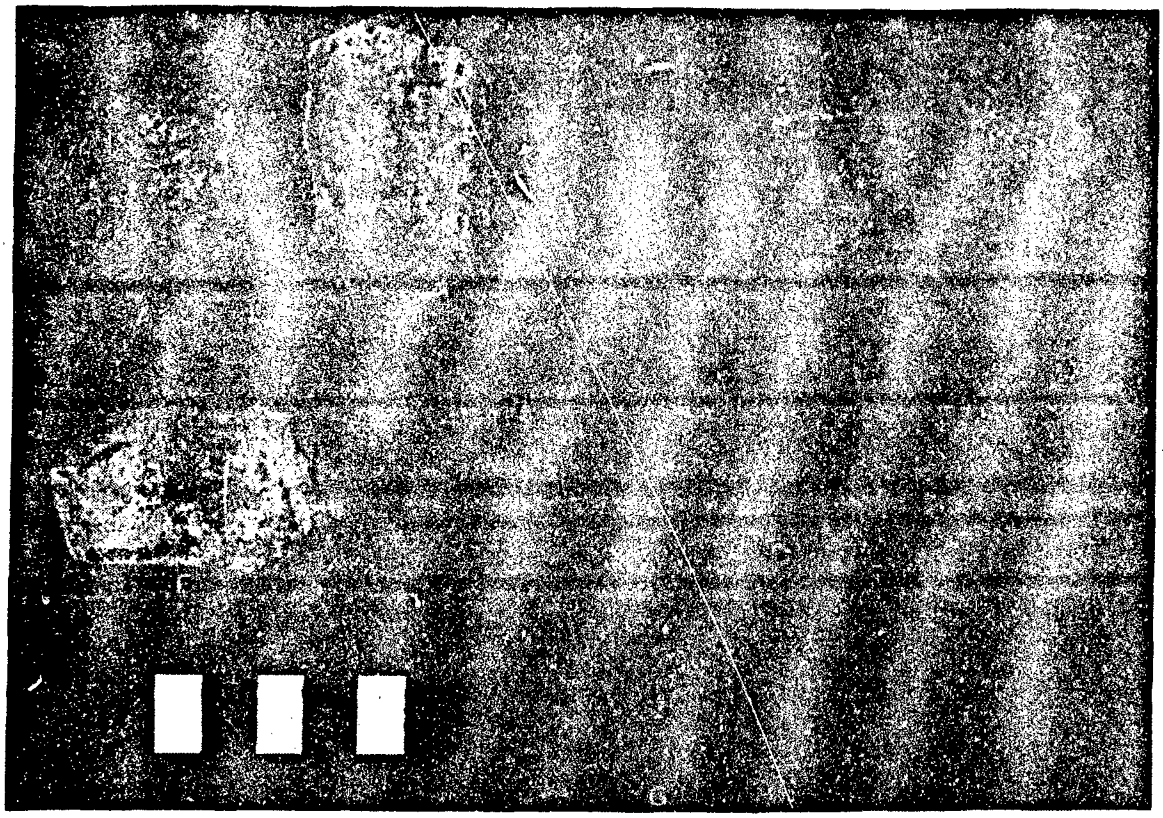


Plate 6. Selected artifacts from 3MS471: A, C, & D. cordmarked, sand-tempered sherds; B. redfilmed, sand-tempered sherd; E. punctated, cordmarked, sand-tempered base sherd; F. battered quartzite; G. Dover chert hoe; H. orthoquartzite arrow preform.

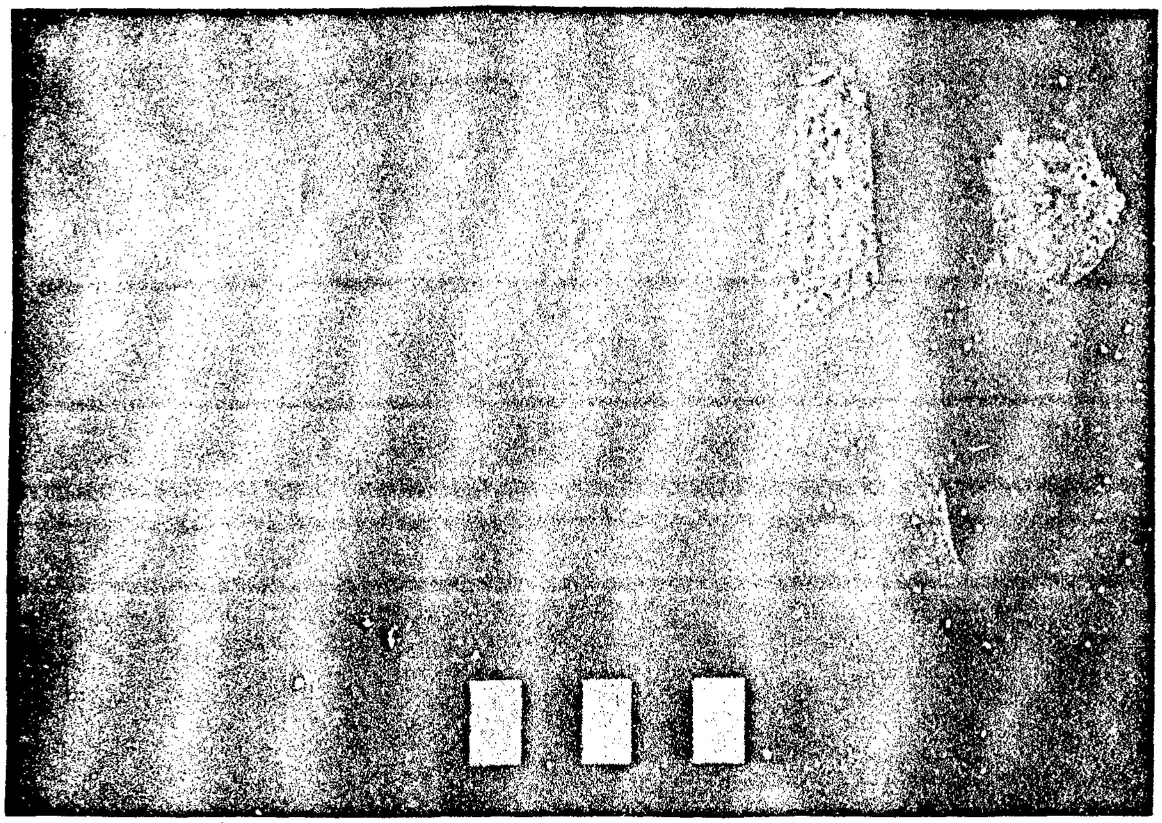


Plate 7. Selected artifacts from 3MS119: A thru D. shell-tempered sherds; E. cordmarked, sand-tempered sherd; F. ground granitoid.

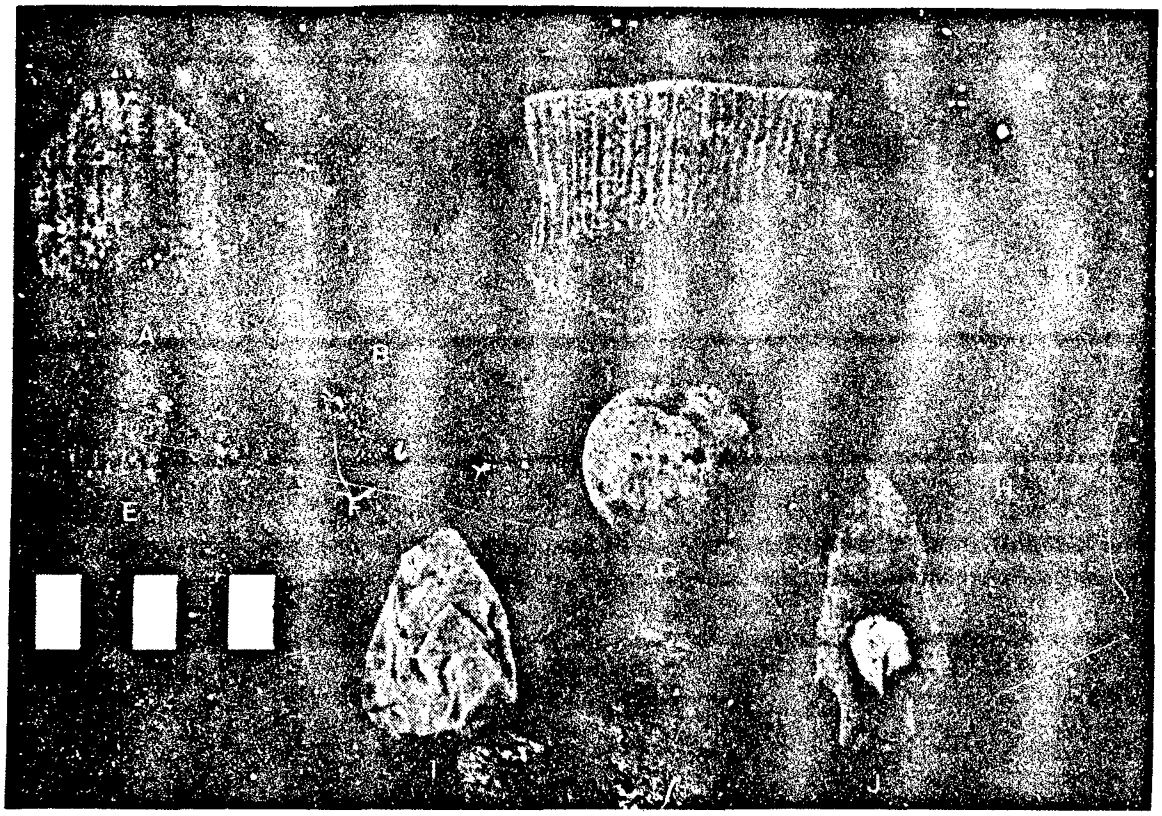


Plate 8. Selected artifacts from 3MS21: A thru F. cordmarked, sand-tempered sherds; G. Poverty Point object; H. cylindrical ceramic bead; I. polished, oolitic biface; J. Late Woodland dart point.

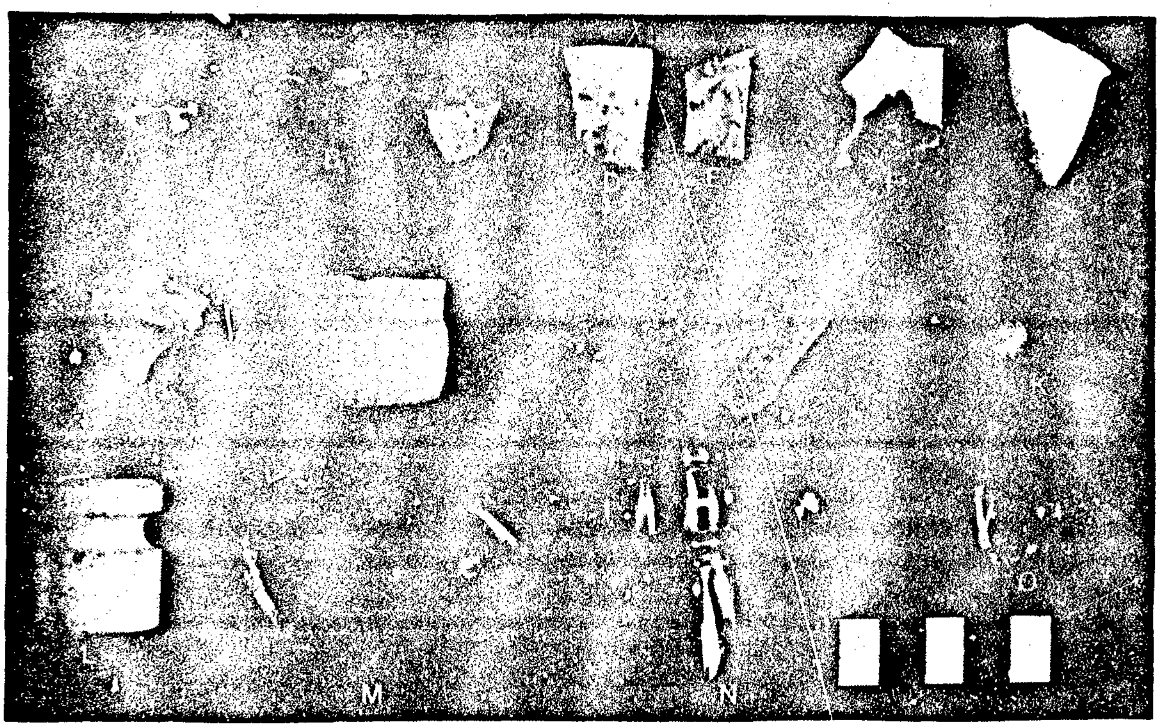


Plate 9. Historic artifacts: A. porcelain tableware, with transfer print; B. blue transfer print sherd; C. whiteware sherd, flo blue; D & G. whiteware, floral decal; E & F. porcelain sherd, floral decal; H & I. milk-glass jar fragment; J. porcelain rim sherd; K. porcelain marble; L. porcelain insulator; M. molded lavender glass base; N. glass bottle neck, crown cap; O. clear glass bottle fragment.

Artifacts from: 3MS471- M; 3MS472- C, I, K; 3MS474- A, B, D, N; 3MS119- F, H; 3MS199- E, G, J, L, O.

APPENDIX F

BRIEF BACKGROUND OF THE CONTRIBUTORS TO THIS PROJECT

Dr. Robert H. Lafferty III served as Principal Investigator (PI) on this project. Dr. Lafferty took his Ph.D. in 1977 from Southern Illinois University. Since 1976 he has spent 27 months in the field directing all kinds of cultural resource management projects, authored or co-authored ten books and more than thirty smaller technical reports and papers. His projects have involved NRHP significance testing of 76 different archeological sites. He has developed and tested predictive models on five projects. Dr. Lafferty directed the field work, authored most of the report, and served as the principal point of contact with the sponsoring agency. He was responsible for the overall execution of the project.

Dr. Margaret J. Guccione took her PhD in 198 at the university of Colorado in Geomorphology. Dr. Guccione is Assistant Professor in the Department og Geology at the University of Arkansas and has conducted a number of studies on Pleistocene and Holocene deposits in the Midwest and Lower Mississippi Valley. Dr. Guccione conducted the Geomorphology research in the project and wrote Chapter 5.

Dr. Beverly J. Watkins took her PhD in 1986 in history at Auburn University. She has conducted many research projects into various aspects of Arkansas and Southern history and is currently a freelance historian. She conducted the archival research and and wrote the Archival documentation.

Ms. Linds J. Scott is ABD in Pallonology from the University of Colorado. She has researched and authored many reports on pollen from the American Southwest, Midwest and the Lower Mississippi Valley and directs the Palanological Laboratory in Lake City ?? Colorado. Ms. Scott directed the pollen work and was the principal author of Chapter 7.

Ms. Kathleen M. Hess serves as Laboratory Director, office manager, and principal analyst on all MCRA projects. She was employed by the Arkansas Archeological Survey for more than four years in the position of Assistant Laboratory Director in their central laboratory in Fayetteville. She holds a BA in Sociology from Quincy College. Ms. Hess was responsible for artifact processing, labeling, and analysis on this project.

Mr. Michael C. Sierzchula serves as Project Archeologist and lithics analyst on projects and will direct this project. He has 8 years experience working in archeology in the Southeast and West. He took his MA at the University of Arkansas and has extensive experience in report writing and fieldwork.

Ms. Amy Hess is draftsperson. She has experience with computer drafting as well as standard drafting techniques. She drafted all of the archeological figures.

Ms. Mary Printup is editor for MCRA manuscripts. She served as editor for the Arkansas Archeological Survey for ten years. Ms. Printup received her B.A. in English from Southwestern University at Memphis. Ms. Printup copy editied this report.

APPENDIX G

MANAGEMENT SUMMARY

INTRODUCTION

The goals of this project were laid out in the Request for Proposal (RFP: Solicitation NO: DACW66-85-R-0061) by the Memphis District, Corps of Engineers, in order to place the proposed enlargement of Ditches 10, 12, and 29 in compliance with the referenced legislation and regulations. These goals are:

a. Research Design
b. Cultural Resources Review
c. Intensive Survey
d. Initial Site Testing
e. Geomorphic Study
f. Laboratory Processing, Analysis and Preservation
g. Curation (RFP:C-4)

Mid-Continental Research Associates (MCRA) responded to the RFP with a proposed Research Design that specified how we planned to achieve the other goals in the project. Each of these is discussed below with a detailed summary of the results and conclusions reached for cultural resources evaluation purposes.

CULTURAL RESOURCES REVIEW

A comprehensive cultural resources review of the records in the Office of the State Archeologist was performed. This included all known sites within 200m of the project area, photo copying of the General Land Office maps and the 1939 United States Geological Survey quadrangle maps. This resulted in the identification of seven known archeological sites within 200m of the project area, including the Zebree site (3MS20). These sites were recorded on project maps so that they could be related to the sites discovered on the survey.

CULTURAL RESOURCES SURVEY

The cultural resources survey was conducted during the beginning of February 1986 with a crew of six persons. Over virtually all of the 52.8 km (33 miles) survey area surface visibility was excellent, with fallow fields with near 100% visibility or very young winter wheat with 60-80% visibility. Only one area of 400m (1/4 mile) was in forest. The forest area required closer spacing of the systematic shovel tests (normally placed every 200m and excavated to 50cm deep in all parts of the survey area) to 50m intervals.

The survey resulted in the identification of only three previously known sites (3MS21, 3MS119, and 3MS199) in the project area. In addition 21 other locations were identified as potential archeological sites. These were duly reported to the Office of the State Archeologist (OSA). The OSA assigned eight site numbers to nine of the reported potential site locations. This results in a total of eleven archeological sites in the total project area.

The following potential sites were not assigned site numbers: 29A1, 29A2, 29A4, 29A14, 29A15, 29A17, 29A18, 29A19, 29A20, 29B1 and 29B5. The historic sites have been placed in a site lead file to be activated when the historic sites are over fifty years old, and will be reassessed then. In all cases, I concur with the OSA's decision not to assign site numbers, but I believe we were correct in reporting these as potential locations.

Two potential sites (PS), 29A2 and 29A4, were isolated prehistoric artifacts. PS 29A2 was an isolated Mississippi period sherd found on the spoil pile of Ditch 29. We returned to this location during the testing phase, and two persons walked systematically over a 200m x 200m area on all sides of the flagged find at 1m intervals. No additional material was found. This area was prehistorically a part of Big Lake and is covered with Sharkey Clay. Therefore, there is a low probability that this is an intact site.

PS 29A2 is in a low clayey area near Ditch 10 and Buffalo Creek Ditch. Intense surface searching around the isolated flake failed to locate any additional material. There are other known sites on the higher sandy ground to the northeast and southwest of the isolated find, which formed the levee of the Buffalo Creek. This is therefore a low probability location and is probably the result of plow drag from the adjacent known sites.

Ten potential sites were recent historic house sites (29A1, 29A14, 29A15, 29B5, 29A18, 29A19, and 29A20) and historic dump sites (29B1, 29A17 and 29A21). The recent house sites were shown on the 1956 quad maps, but not on the earlier quad maps. All of these sites had indications of 1950s artifacts and no artifacts were found suggesting a pre-1930s occupation.

This left 11 sites in the project area (3MS21, 3MS119, 3MS199, 3MS471-478). Two of these sites (3MS475 and 3MS476) were determined to be out of the impact zone and in conference with the Contracting Officer's Representative were eliminated from the testing program. Consequently, nine sites and one PS were tested.

INITIAL SITE TESTING

The Scope of Work required a 25% Controlled Surface Collection (CSC) and a 1m x 1m test unit excavated to assess the depth and composition of the archeological matrix at each site. We had estimated that total collections would cover ~11,000 m2 and that 7 cubic meters would be excavated in the test units. Even though the sites were fewer than expected, four (3MS21, 3MS119, 3MS199 and 3MS471) were quite extensive. As a result 15,025 square meters of controlled surface collections were made in 5m x 5m controlled units on eight sites and one PS (29A1). With the exception of the four extensive sites we have good control over the surface manifestation of all sites. The surface manifestations of the ninth site (3MS477) were so sparse that the artifacts were point plotted.

Test units were positioned in an impressionistically determined high density area after the CSC had been made. A total of ten test units were excavated on the nine sites and one on PS 29A1. These totaled approximately 7.8 cubic meters excavated in 10cm levels, and all levels were screened in 1/4" mesh shaker screens.

SIGNIFICANT SITES

Site No. 3MS199

Period/Time: Prehistoric Early Mississippian, Early (?), Middle, Late Woodland, Historic (GLO)

Estimated Site Area: >6ha (15 acres)

CSC (Square meters): 2,525

Maximum known depth: 74cm

Nature: Scatter of prehistoric and historic materials on both sides of the ditch, and probably north into Missouri. The CSC extended 300m on the levee side of the ditch (east) and about 100m west of the ditch to the limit of the site. The north site limit is currently undefined and the east edge is under the Big Lake Levee. The test unit was placed in a high density of the scatter and archeological materials were recovered to 74cm BS. This was apparently stratified in a sandy matrix with a little carbon observed in the matrix. Below the base of the plowzone at 30cm the whole deposit was stratified Woodland period ceramics, which were largely Sand Tempered-Cordmarked. Three rim sherds and a possible lizard effigy were recovered in this unit. The sherd density was as high as 600 per cubic meter.

NRHP Significance: This site is stratified and has what is probably a Woodland sequence capped by Mississippian in some areas. There are deeply buried deposits and, given the surface of the prehistoric, landscape there is every reason to expect that there are deposits which are deeper and more highly stratified. This site has important data on the little-understood Woodland in the Central Mississippi River Valley.

Data Limitations: The surface limits of the site have not been fully defined by controlled surface collection. We have even less of an idea of the subsurface extent of the site and variation present in site depth.

Proposed Impacts: This site is currently cut by Ditch 10 and will have a much larger area excavated on the east side, where the levee is located.

Proposed CRM Recommendations: (1) More extensive testing to define site limits and more fully document artifact variation and surface limit, (2) route project around the site , or, (3) cancel this section of the project.

Site No.3MS471 (2B)

Period/Time: Middle & Early Mississippian, Woodland & Historic (19th century)

Estimated Site Area: 3.5ha

CSC (Square meters): 1,000

Maximum known depth: 55cm BS

Nature: Scatter of historic and prehistoric materials in plowed field. There were large prehistoric sherds in a fairly dense concentration on the highest part of the site. The test unit was excavated in this part but the CSC was made at a later date after the freshly plowed surface had been rained on. The CSC area was severely restricted in extent by the seep ditch which had flooded all but the highest part of the site. The test unit was excavated to 75cm BS. The culture-bearing matrix was obvious and present to 55cm, where it abutted the B Horizon soils.

Data Limitations: The surface limits of the site have not been fully defined by controlled surface collection. Due to the flooding of the seep ditch none of the edges have been defined by the controlled surface collection. We have even less idea of the subsurface extent of the site and what variation is present in site depth.

Proposed Impacts: This site is currently cut by Ditch 10 and will have a much larger area excavated on the east side, where the levee is located.

Proposed CRM Recommendations: (1) More extensive testing to define site limits and to more fully document artifact variation and surface limits, (2) route project around the site , or, (3) cancel this section of the project.

Site No. 3MS119

Period/Time: Early Mississippian, Barnes, Historic Tenant(?)House

Estimated Site Area: >6ha

CSC (Square meters): 2,050

Maximum known depth: >85 cm BS

Nature: This is a dense scatter of prehistoric and historic material on a well drained sand ridge. There is one standing house which is still occupied and two locations which look like previous house sites. This site is on both sides of the ditch. The test unit was excavated to 85cm below surface when excavation was terminated due to objections of the landowner. At this level we had just identified a post mold or small pit with Varney Red Filmed sherds. The matrix we had been digging through was a Woodland period midden. This site covers a much greater area than originally reported. We currently have good data on the southern limits of the site and no other areas. Mr. Ray Benefeld, who grew up in the house on the site and as a boy collected points from its surface, stated that he had picked points up as far north as the fence. He indicated that most of his large points came from a steep slope which appears to correspond to the old levee slope, and asked whether we thought that the area east of the ditch with a lot of white chert was prehistoric. Investigations of this area indicated that it was a relatively dense concentration of Crescent quarry lithic debris. The author visited Mr. Benefeld's house and looked at his point collections. He identified one board of points found by his brother which he was sure had come only from 3MS119. This board contained at least three Dalton points, 20-30 Archaic points, and a few arrow points.

NRHP Significance: This site is perhaps the most significant of the four large sites discussed in this section. The site has features and an incredible midden. We were into the Early Woodland levels, as evidenced by Poverty Point objects, when excavations had to be halted. This is apparently a stratified deposit which is extremely important for defining cultural change and continuity in the Central Mississippi River Valley.

Data Limitations: The surface limits of the site have not been fully defined by controlled surface collection. We have even less idea of the subsurface extent of the site and variation present in site depth.

Proposed Impacts: This site is currently cut by Ditch 10 and will have a much larger area excavated on the east side where the levee is located.

Proposed CRM Recommendations: (1) More extensive testing to define site limits and more fully document artifact variation and surface limit, (2) route project around the site , or, (3) cancel this section of the project.

Site No. 3MS21

Period/Time: Historic, Early Woodland, Middle Woodland, Dunklin Phase, Baytown (?), Early Mississippian

Estimated Site Area: >3ha

CSC (Square meters): 3,550

Maximum known depth: >125cm BS

Nature: This site contained a mound reported southwest of the house site. There was a scatter of sherds and lithics on the sandy ridge running north to south and on both sides of Ditch 10. Two pots were reported to have been dug out near Ditch 10 on the ridge in the 1960s. The historic house site probably has some antiquity. Two test units were excavated on this site on both sides of the ditch. Test Unit 1 on the west side contained a stratified sequence of three paleosols, separated by white sand. This terminated at 1m below surface in an assemblage which had cordmarked pottery and a mass of unfired Barnes clay body and Poverty Point Objects. Test Unit 2 on the east side of Ditch 10 had stratified deposits to 125cm where excavations were terminated due to the rising water table. Poverty Point Objects, daub of a large size and a fired clay hearth was recovered in this unit. A core was taken from the north part of this site, and what appeared to be coarse sands of the Relict Braided Surface were encountered at 2m BS.

NRHP Significance: The fact that two features were identified in two test units is enough to make this site significant. The association of daub in large pieces, with large (2cm) diameter cane impressions associated with Woodland pottery is also quite rare. This site also contains carbon and had a mound. This is clearly a significant site and may possess unique qualities.

Data Limitations: The surface limits of the site have not been fully defined by controlled surface collection. We have even less idea of the subsurface extent of the site and what variation is present in site depth.

Proposed Impacts: This site is currently cut by Ditch 10 and will have a much larger area excavated on the east side where the levee is located.

Proposed CRM Recommendations: (1) More extensive testing to define site limits and to more fully document artifact variation and surface limit, (2) route project around the site, or, (3) cancel this section of the project.

Site No. 3MS477 (29A10)

Period/Time: Barnes

Site Area: ~0.12ha

CSC (Square meters): 17 artifacts point plotted

Maximum known depth: ?

Nature: Light scatter of Barnes sherds and some lithics between Ditch 10 and levee. No material was collected on the west side of the ditch. The site area was walked at a meter interval by a crew of five persons. All artifacts were flagged and then mapped. Artifacts recovered consisted of very small Barnes sherds and one core (Crowleys ridge gravel) chopper tool. No material was recovered in the test unit. The documented presence of the spoil pile on the east side of the ditch and the geomorphic location of the ditch strongly suggest that there may be deeply buried deposits in this part of the project area.

NRHP Significance: Unknown

Data Limitations: No intact deposits have been found in the limited investigations.

Proposed Impacts: Unknown

Proposed CRM Recommendations: (1) More extensive testing, (2) route project around the site, or, (3) cancel project this section of the project.

The above five sites are in an area which has demonstrated stratified deposits which could very well span the archeological record. I believe that these deposits are significant in terms of the NRHP criteria and that it is quite possible that in places there will be buried deposits as deep as 3 or 4 meters. These five locations need more extensive investigations that will define the nature of the deposits and date them.

INSIGNIFICANT SITES

Site No. 3MS474 (29A6)

Period/Time:Historic, Early to middle 20th century
Site Area: .36 ha
CSC (Square meters): 1425
Maximum known depth: 30 cm BS (Plowzone)
Nature:Artifact scatter in corner of field adjacent to road.
NRHP Significance: Archeologically this site is not significant because it is largely disturbed by plowing (and there are still some of these sites which have not been plowed) and is mostly from the plastic period.
Data Limitations: There could be undisturbed sub-plowzone features.

Proposed Impacts: Equipment tracking over in association with excavation and tree clearing.
Proposed CRM Recommendations: No further archeological work.

Site No. 3MS473 (29A3 & 29A5)

Period/Time: Mississippian, Historic
Site Area: >0.25 ha
CSC (Square meters): 1200
Maximum known depth: 33 cm
Nature: Light scatter of prehistoric material on both sides of Ditch 12 on edge of sandy soils which were at one time the levee of Buffalo Creek. This is very low density with a high proportion of lithics. Historic component appears to be older dump site though some bricks are in evidence. The historic component is only on the south bank concentrated around the ditch and is probably a dump. The artifacts on the north side of the ditch were point plotted and all were on the spoil pile. The test unit was excavated off the spoil pile on the south side of the ditch. Historic material was found in the 20cm thick plowzone and two flakes were found in the succeeding two levels (20-40 cm BS). Excavations terminated at 60cm without encountering any additional material.

NRHP Significance: The historic component is too recent to be significant in terms of the NRHP criteria. The prehistoric component does not have the demonstrated characteristic of a significant site. The artifacts are in very low density (10 flakes per cubic meter, and three prehistoric artifacts in the controlled surface collection). The soils are not anthropocized. This site is in a high probability area for buried deposits, and there are other known productive sites located along this same levee.
Data Limitations: The distribution of artifacts suggests that the main part of the site is buried under the spoil pile on

the south side.

Proposed Impacts: brush clearing

Proposed CRM Recommendations: Have archeologist monitor and record profile during brush clearing.

Site No. 3MS472 (4B)

Period/Time:Historic

Site Area: 0.25 ha

CSC (Square meters): 1400

Maximum known depth: 40cm BS

Nature: Scatter of artifacts in corner of field adjacent to road includes building materials and domestic artifacts. This is adjacent to the the Osceola to Grand Prairie, Missouri road shown on the GLO Maps and still partially used in 1903. The road followed the higher levee on the west side of Big Lake. The artifacts recovered in the CSC were from a wide range of time, but tended toward the Early 20th century.

NRHP Significance: Probably not significant.

Data Limitations: Have not completed documenting historic association and artifacts.

Proposed Impacts: Equipment tracking during construction, brush clearing

Proposed CRM Recommendations: No further archeological work.

Site No. 3MS478 (A16)

Period/Time:Historic

Site Area: 0.64 ha

CSC (Square meters): 1,800

Maximum known depth: 24 cm BS (Plowzone)

Nature: Scatter of artifacts in corner of field adjacent to road includes building materials and domestic artifacts. This is adjacent to the the Osceola to Grand Prairie, Missouri road shown on the GLO Maps. This site appears to be different from 3MS472 on the north of the ditch, with most of the concentration located outside of the impact zone. The deposits are restricted to the plowzone.

NRHP Significance: Probably not significant.

Data Limitations: Archival and artifact analysis still in progress.

Proposed Impacts: Equipment tracking during construction, brush clearing.

Proposed CRM Recommendations: No further archeological work.

Site No. 3MS475 (29A8)

Period/Time: Mississippi

Site Area:)0.14 ha

Nature: Small restricted and nucleated scatter of sherds 40m west of Ditch 10. Probably an isolated farmstead but could be part of a larger buried site.

NRHP Significance: Unknown

Proposed Impacts:None

Proposed CRM Recommendations: No further archeological work.

Site No. 3MS476 (29A9)

Period/Time:Barnes
Site Area: >0.16 ha
Nature: Small highly restricted scatter of Barnes pottery. May be related to 3MS475 and 3MS477.
NRHP Significance: unknown
Proposed Impacts: None on edge of west impact zone.
Proposed CRM Recommendations: No further archeological work.

GEOMORPHIC STUDY

Dr. Guccione has conducted field work in all parts of the project area and is still in the process of analyzing her results. The below preliminary summary of the Cultural Resources Management implications is still subject to correction by her. They are based on discussion with her while in the field and my own observations. The field work has involved sampling exposed profiles and hand cores in the Buffalo Creek Channel, the Relict Braided Surface ar⁴ the edge of Big Lake. She provided on-site geomorphic description and interpretation of the pollen columns extracted from Big Lake (8m deep) and the Pemiscott Bayou Channel (6m deep).

Most of the east-west course of Ditches 10 and 12 are through the Relict Braided surface laid down in terminal Pleistocene times. These are the oldest soils in the project area, are predominantly coarse sands, and have no chance of having buried archeological deposits contained in them.

On the west end of Ditches 10 and 12 is the old course of Buffalo Creek. This is an incised, braided channel which has filled in with more recent clays containing preserved wood. There is a high potential for buried deposits on the edges of these clays.

On the western edge of Big Lake, the seep ditch follows near the edge of the braided surface which has been buried by up to 2m and, perhaps more, of alluvially deposited fine sands and silts. These contain the deposits excavated in archeological sites 3MS21, 3MS119, 3MS199 and 3MS471. There is a high probability of buried sites from 3MS21 north on the project area.

South of 3MS21 the soils are wet clays. The Osceola to Grand Prairie, Missouri, road swings 1/2 mile toward the west along the well drained soils on the edge of the braided channel. The channel cuts south along the course of Ditch 12 toward Manila. There is a low probability of deposits in this channel, but at the contact there is a higher probability.

Ditch 29 cuts through what was part of the lake bed of Big Lake west of state route 151 below about 237 feet AMSL. East of this it cuts across high ground above 250 feet AMSL and then into Pemiscott Bayou. It cuts through the outside of the meander loop which should have some of the most recent deposits in the project area. There is a high potential for recent prehistoric deposits along this edge of Pemiscott Bayou.

ARTIFACT PROCESSING, ANALYSIS, PRESERVATION, AND CURATION

We have washed, numbered and analyzed the collection generated from this project. Collections are brought to the curation standards of the Arkansas Archeological Survey which has agreed to curate the collections forever for the people of the United States.

RECOMMENDATIONS

The age of the deposits along the western edge of Big Lake, demonstrated stratified archeological deposits and age of artifacts directly attributable to 3MS119, all indicate that there are substantial buried deposits ranging in time from Dalton to Mississippian times. The four sites thus far tested have produced substantial stratified Woodland deposits that appear to span the whole Woodland period. It is quite probable that there are many more buried isolatable deposits in these sandy ridges and even on the edges of the swales. Indeed, on the northwest edge of 3MS119 there is an area which has produced a very large quantity of white chert and may be a lithic reduction area.

Therefore, more substantial archeological testing of 3MS21, 3MS119, 3MS199 and 3MS471 needs to be conducted to define their limits and to define the variation in subplowzone deposits in terms of depth, areal extent, content variation and variation in preservation. This should be coupled with limited backhoe work between the sites to more precisely define their geomorphic context and particularly in the 3MS477 area, to see if there are buried deposits with little or none of the top showing.

Ditch 29 should be cleared for construction. At both of the possible sites, upon intense investigation, we were unable either to locate from whence the prehistoric deposits were coming, or else the historic site has proven to be too recent to be considered significant in terms of the NRHP criteria.

Sites 3MS472, 3MS474, and 3MS478 are all probably not significant, but final determination needs to await the analysis of the artifacts and the completion of the Historic analysis. They will not be impacted by the proposed construction, and archeological clearance of these areas is recommended.

Site 3MS473 is not demonstrated to be significant; however, if the south side is to be extensively excavated, this work should be monitored, as this is a high probability area for sites.